

EXHIBIT A

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

ENVIRONMENTAL ASSESSMENT
ANSCHUTZ PROPOSES THE DRUMLIN
PAD

DOI-BLM-UT-G010-2024-0064-EA

January 2025

Location:

Sections 30, T10S, R24E, S.L.B.&M.
Uintah County, Utah

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BLM



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1.0 INTRODUCTION

Anschutz Exploration Corporation submitted eight Applications for Permit to Drill and a right-of-way application for a lay-flat waterline. To accommodate potential production from Anschutz's applications, Utah Gas Corporation applied to amend existing right-of-way UTU-73643 (authorized in 1964) by upgrading the diameter of an existing pipeline. The applications for permit to drill and rights-of-way are interdependent and therefore have been jointly analyzed in this Environmental Assessment (EA) and are collectively called Drumlin.

The project location is on BLM-administered land approximately forty linear miles southeast of Vernal, Utah in Section 30 Township 10 South, Range 24 East, Section 6 Township 11 South, Range 24 East, and Sections 25 and 36, Township 10 South, Range 23 East, Uintah County, Utah. The proposed wells are in an existing gas field. There are six well pads within one mile of the proposed Drumlin wells (see Figure 1-1). The nearest residential buildings are five miles away from the Drumlin project, and the nearest community is eight miles away.

The EA addresses the initial development of the Glacier (Deep) Unit¹, including the unit obligation well, the Drumlin Fed 10-24-30-5-13 MCH, which if capable of production will hold the unit.

Four of the Applications for Permit to Drill have wellbores associated with litigated leases (see Table 2-1 which identifies the litigated leases and the litigation number). The well pad is not located upon the litigated leases. Therefore, the BLM prepared the EA in accordance with the guidance in Permanent Instruction Memorandum 2022-001, National Environmental Policy Act Compliance for Applications for Permit to Drill Where the National Environmental Policy Act Prepared to Support the Authorizing Lease is Under Review Related to Litigation².

¹ The Glacier (Deep) Unit was approved effective May 16, 2024. The Unit was expanded by decision dated June 18, 2024, which also identified the Drumlin Fed 10-24-30-5-13 MCH as the obligation well.

² <https://www.blm.gov/policy/pim-2022-001-0>

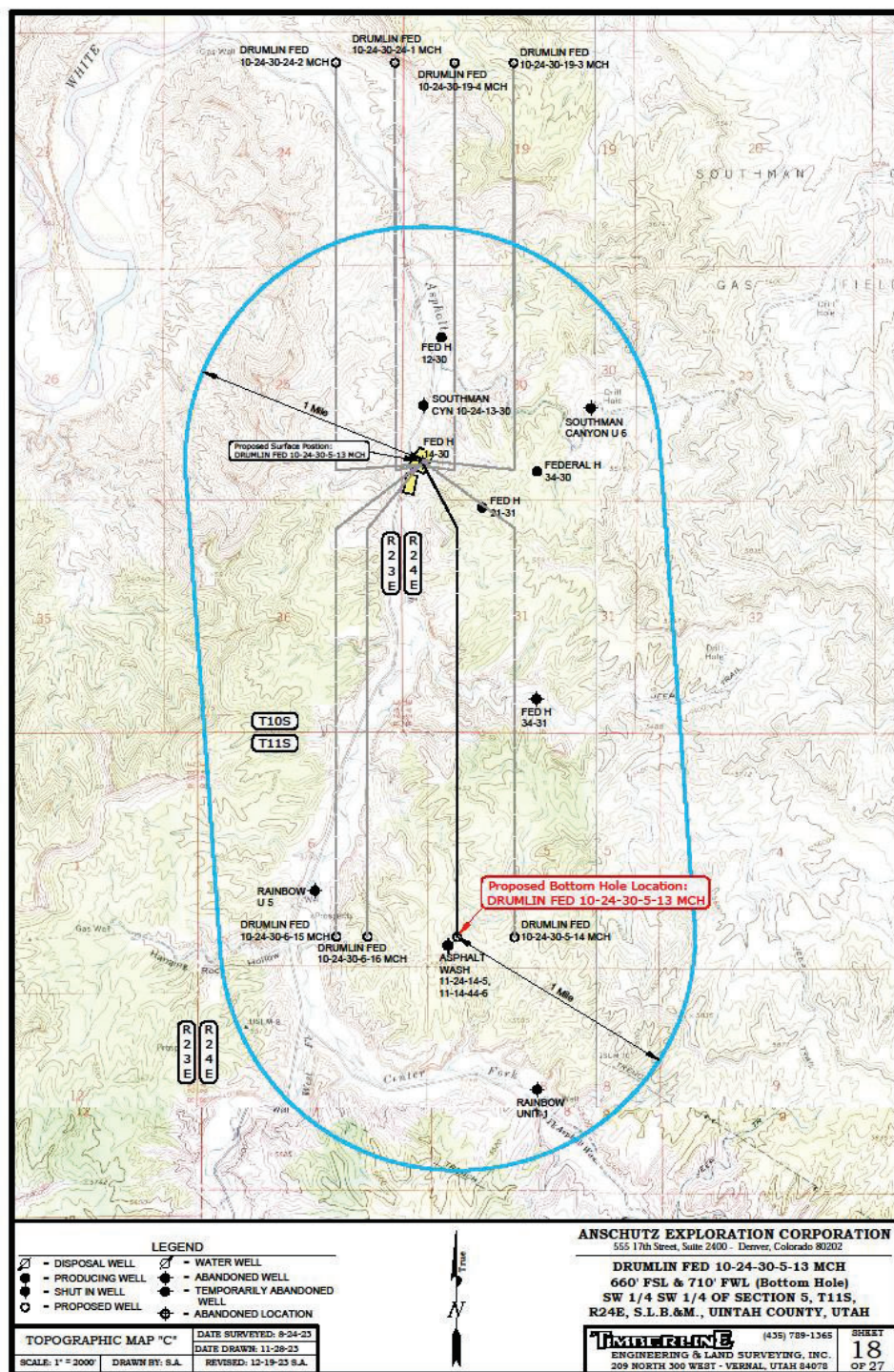


Figure 1-1: Well Pads Within One Mile of the Drumlin Well Pad

1.1 PURPOSE AND NEED

The BLM need is to respond to Anschutz’s eight Applications for Permits to Drill in the Glacier (Deep) Unit, Anschutz’s lay-flat waterline right-of way application, and Utah Gas Corporation’s application for amendment to right-of-way UTU-73643 in accordance with 43 CFR 3171 and Title V of the Federal Land Policy and Management Act of October 21, 1976, as amended through September 1999, (90 Stat. 1776; 43 U.S.C. 1761). The BLM’s purpose is to protect other resources in compliance with applicable law, regulation, and policy.

1.2 DECISION TO BE MADE

The BLM decision to be made is whether to deny or approve (with appropriate terms and conditions) the Applications for Permits to Drill with their associated surface-disturbing activities and the application to amend the right-of-way.

1.3 CONFORMANCE WITH BLM LAND USE PLAN(S)

The Proposed Action would be consistent with the objectives, goals, and decisions of the 2008 Vernal Field Office Resource Management Plan, as amended, as they relate to the Minerals and Energy and Lands and Realty programs, specifically the following:

MIN-2: “Mineral and energy resource exploration and development surface-disturbing activities will be allowed in the [Vernal Planning Area] unless precluded by other program prescriptions. The stipulations identified for surface-disturbing activities in Appendix K will generally apply to these activities.”

LAR-30: “All future right-of-way applications involving projects that are less than the major project thresholds described above will be evaluated on a case-by-case basis. Future rights-of-way will be consolidated in corridors where reasonable and economically feasible (p. 90).”

1.4 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

The Proposed Action conforms with the requirements of the National Environmental Policy Act³. The Environmental Assessment was prepared to document the impacts of the Federal decision.

The Proposed Action would conform with Utah’s State Resource Management Plan policies. Utah’s general policy on energy production is support for all forms of energy development,

³ The BLM is aware of the November 12, 2024 decision in *Marin Audubon Society v. Federal Aviation Administration*, No. 23-1067 (D.C. Cir. Nov. 12, 2024). To the extent that a court may conclude that the Council on Environmental Quality (CEQ) regulations implementing NEPA are not judicially enforceable or binding on this agency action, the BLM has nonetheless elected to follow those regulations at 40 C.F.R. Parts 1500– 1508, in addition to the DOI’s procedures/regulations implementing NEPA at 43 CFR Part 46, to meet the agency’s obligations under NEPA, 42 U.S.C. §§ 4321 et seq.

especially those located inside the Uintah Basin Energy Zone (63J-8-105.5). The Proposed Action is a natural gas development project within the Uintah Basin Energy Zone.

The Proposed Action would conform with Utah's 10-year Strategic Energy Plan 2.0. The Energy Plan expresses support for continued traditional energy development, such as natural gas, which the Proposed Action targets.

The Proposed Action would conform with the Uintah County General Plan (Uintah County, 2011). Section 4i of the Uintah County Plan states "The County will continue to encourage and support the responsible use and development of natural resources and the associated industries and businesses".

1.5 IDENTIFICATION OF ISSUES

A BLM Interdisciplinary Team identified the issues for analysis. The Checklist (Appendix A) provides the rationales for all issues considered, including those not analyzed in detail in this Environmental Assessment.

1.5.1 AMBIENT AIR QUALITY

How would emissions from the proposed equipment, well drilling, and production impact ambient air quality in the Uinta Basin?

1.5.2 GREENHOUSE GASES AND CLIMATE CHANGE

How would emissions from the proposed equipment, well drilling, and production contribute to greenhouse gases and climate change?

1.5.3 MIGRATORY BIRDS AND RAPTORS

How would the proposed construction, surface disturbance, and noise affect migratory birds, raptors, and their habitats?

1.5.4 BLM NATURAL AREAS

How would the proposed construction and surface disturbance affect BLM Natural Areas?

1.5.5 LANDS WITH WILDERNESS CHARACTERISTICS

How would the proposed construction and surface disturbance affect lands with wilderness characteristics?

1.5.6 VISUAL RESOURCES

How would the proposed surface disturbance and infrastructure affect visual resources?

1.5.7 WILDLIFE: FISH

How would water depletions from the White River for the proposed drilling, completions, and dust control affect Threatened and Endangered fish and their habitats?

2.0 DESCRIPTION OF ALTERNATIVES

2.1 ALTERNATIVE A – NO ACTION

Under the No Action Alternative, the BLM would deny the Applications for Permits to Drill. The right-of-way would not be amended, the proposed wells would not be drilled, and the proposed well pad, access roads, or pipelines would not be constructed or installed.

2.2 ALTERNATIVE B – PROPOSED ACTION

Under the Proposed Action Alternative, the BLM would approve the Applications for Permits to Drill and grant the rights-of-way. After approval, the applicant would construct the well pad. The north portion of the proposed well pad the wells would be drilled from a previously disturbed location which has since naturally revegetated. The south portion of the proposed well pad would hold the production facilities and would be entirely new disturbance. However, both portions of the pad were considered in the disturbance totals analyzed.

The applicant would horizontally drill up to eight (8) gas wells into their target leases (UTU65371, UTU73919, UTU93656, and UTU93659). The total production facilities could include up to 8 well heads, 8 separators/treaters, 24 crude oil tanks (750-barrel), 8 water tanks (750-barrel), and 4 enclosed combustion devices. Spill containment will be constructed around the produced oil and water tanks and the containment system includes a liner that will contain 110 percent of the capacity of the largest tank. Associated infrastructure (i.e., access roads, and pipelines) for the wells are described in the subsections below.

The applicant would drill in two phases. Two initial wells would be drilled and tested for productivity in phase one within the first year after the permits were approved. If the applicant determined these wells successful, the remaining six wells would be drilled in phase two. Both phases would be completed within the three years the approved permits would be valid for.

Table 2-1. Summary of Proposed Wells

Proposed Well (Name and #)	Lease Number(s)
Drumlin Fed 10-24-30-5-13 MCH	UTU065371, UTU073919
Drumlin Fed 10-24-30-5-14 MCH	UTU065371, UTU073919
Drumlin Fed 10-24-30-6-15 MCH	UTU093659*, UTU073919
Drumlin Fed 10-24-30-6-16 MCH	UTU093659*, UTU073919
Drumlin Fed 10-24-30-19-3 MCH	UTU065371
Drumlin Fed 10-24-30-19-4 MCH	UTU065371
Drumlin Fed 10-24-30-24-1 MCH	UTU093659*, UTU093656*
Drumlin Fed 10-24-30-24-2 MCH	UTU093659*, UTU093656*
*Litigated leases; 1:21-cv-00175 WEG vs. Bernhardt	

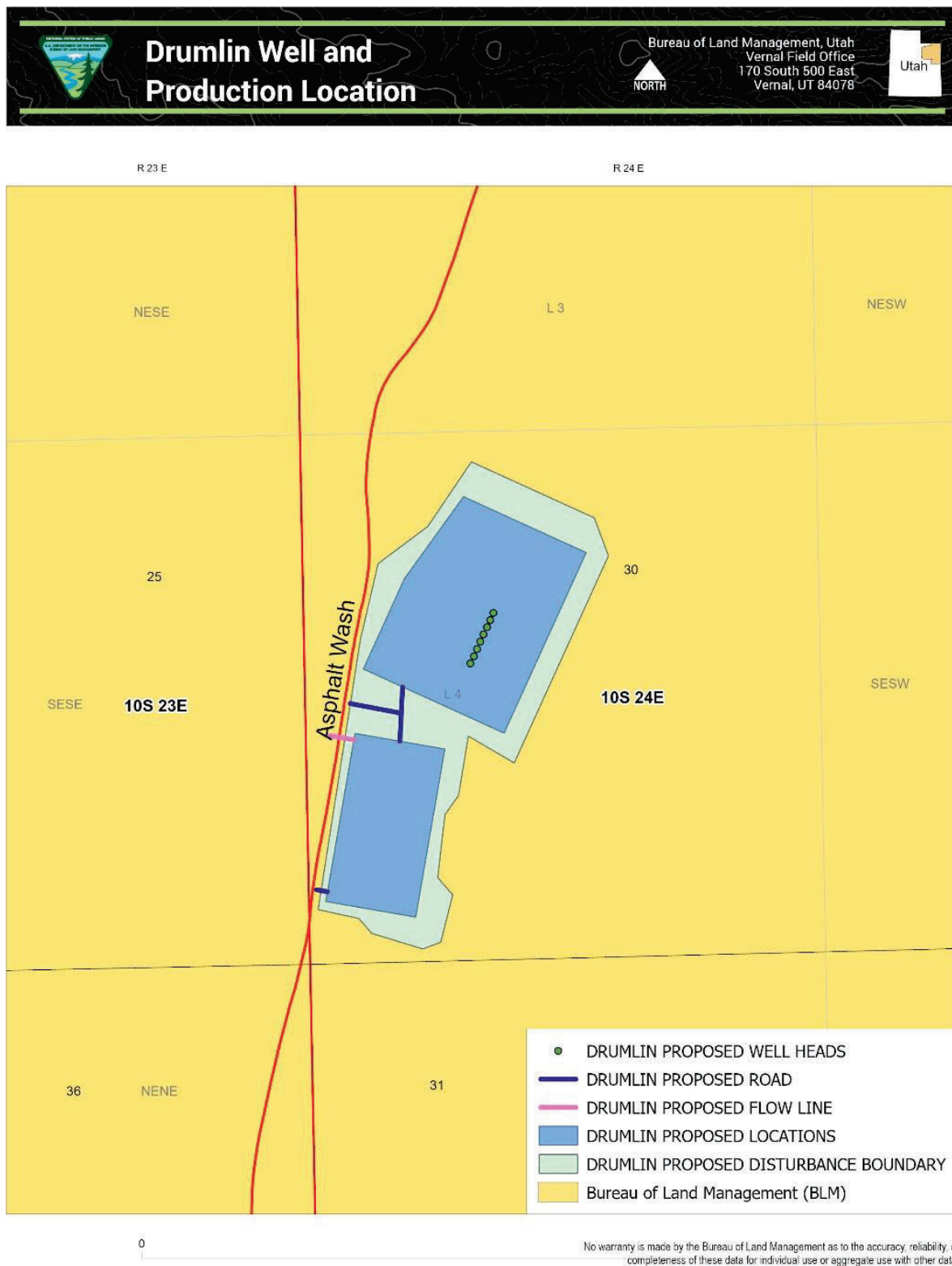


Figure 2-1 Drumlin Well and Production Location

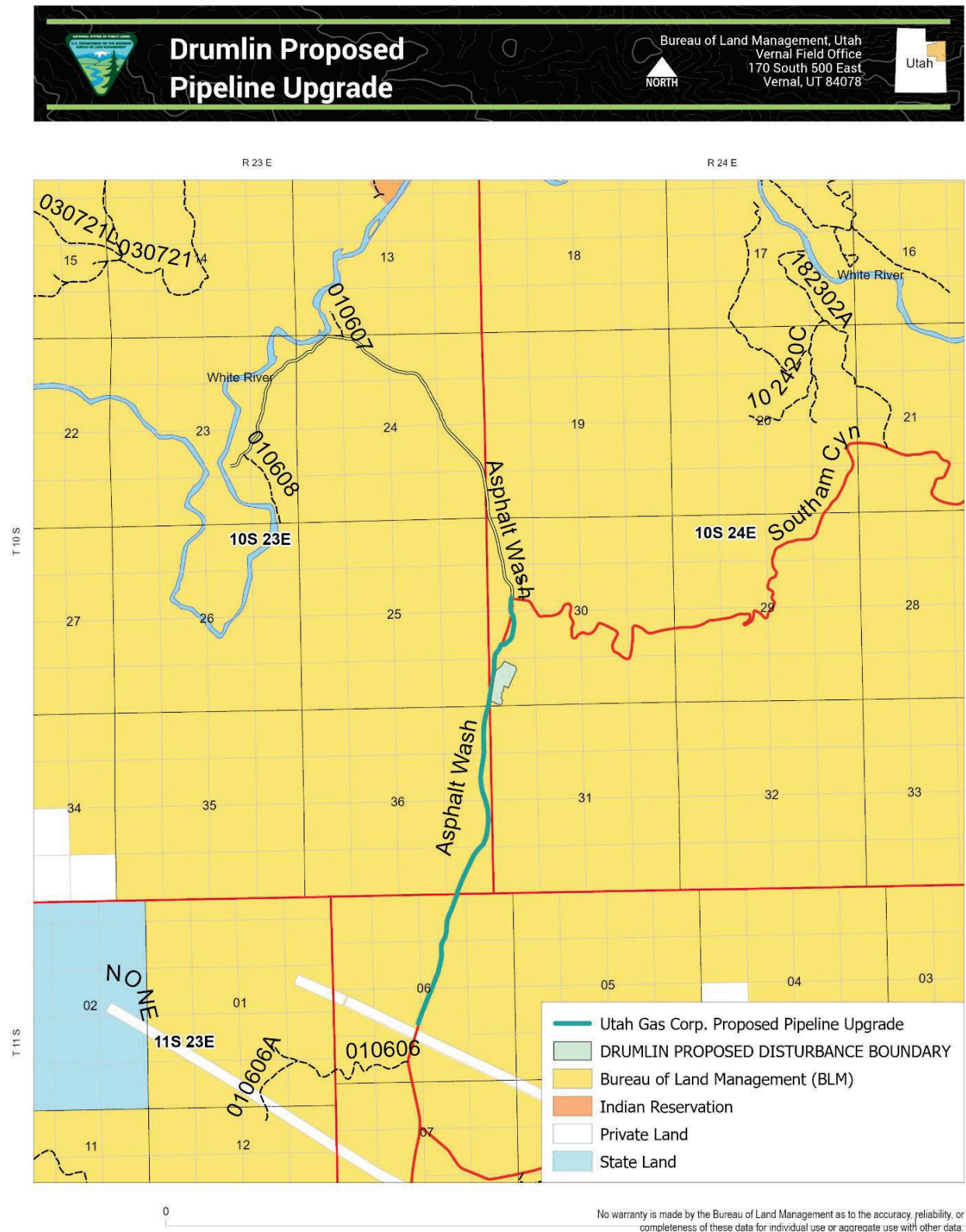


Figure 2-2 Proposed Pipeline Upgrade

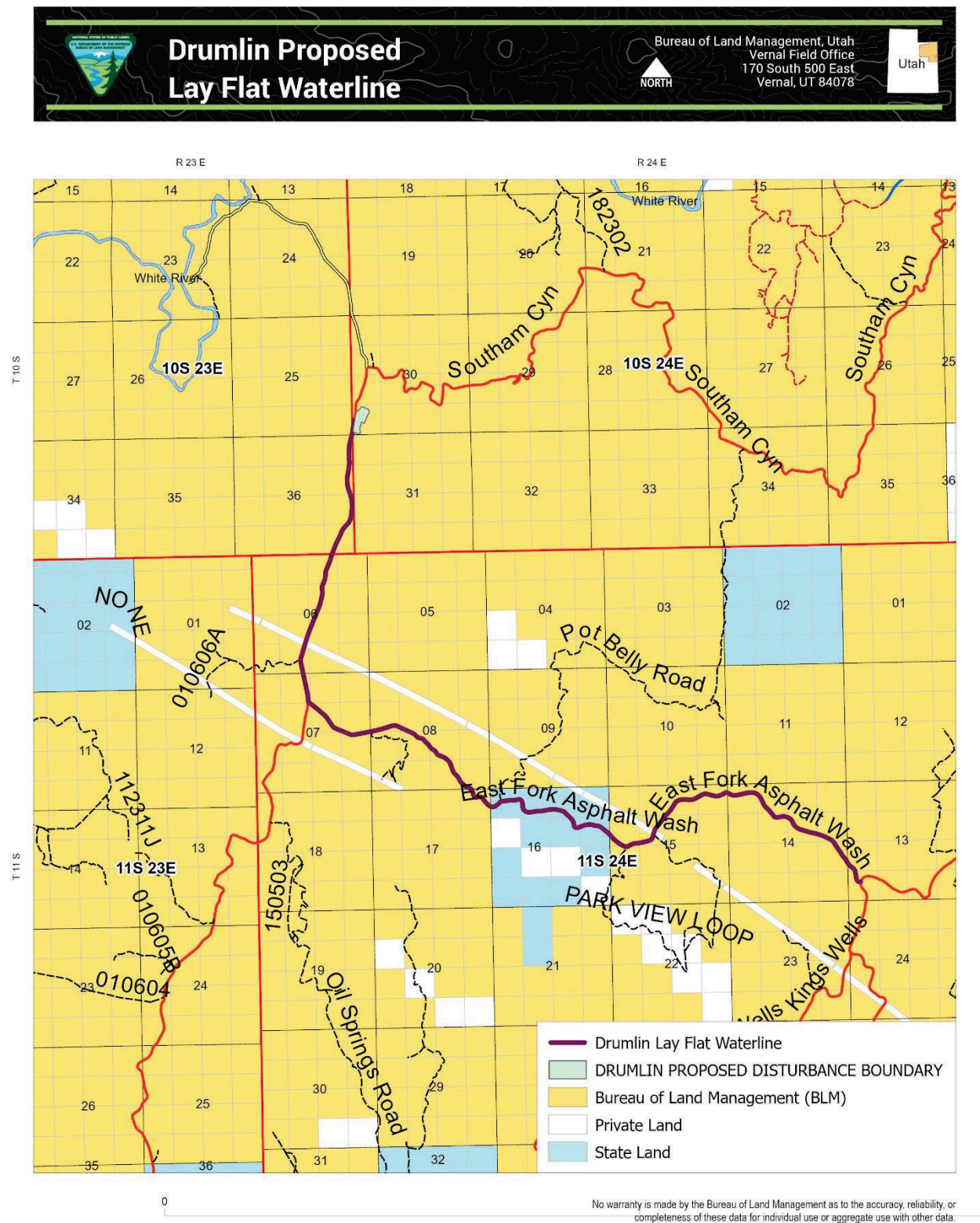


Figure 2-3 Proposed Lay Flat Waterline

Initial surface disturbances for the project would be 28.6 acres (see Table 2-2). During construction, the applicant would remove 6 inches of topsoil and stockpile it separately from subsoil materials for use in reclamation (see Section 2.2.4). Stockpiled topsoil would not be used for facility berms. To preserve soil organic matter content, any vegetation removed during construction would be stockpiled with topsoil.

Production drainage/erosion control design features include rerouting drainages around the pad and installing culverts (minimum 18-inch) or low water crossings. Erosion control techniques (see Section 2.2.6) would be used to minimize wind and water erosion and sedimentation prior to revegetation.

Table 2-2. Acres of Disturbance

Area	Initial Disturbance	Reclaimed Acres	Long-term Disturbance
Well Pad and Access Roads	10.9	3.7	7.2
Pipeline Corridor	17.7	17.7	0
Total	28.6	21.4	7.2

2.2.1 ROADS

Access to the project area would be primarily via existing Uintah County roads (see Figures 2-1 to 2-3). All roads and associated structures would be constructed to meet or exceed the minimum standards in BLM Manual 9113-Roads and BLM Manual 9112-Bridges and Major Culverts unless otherwise approved by the BLM. All maintenance would occur within the existing representative road width.

From the existing Class B Road, Asphalt Wash, 160 feet of new access road would be constructed to the entrance of the well pad (see Figure 2-1 above). The new access road would be crowned (2-3%), ditched, and constructed with a running surface of 24-feet and a maximum disturbance width of 40-feet. Disturbance acres were collectively identified in Table 2-2 above.

Should conditions warrant (i.e., weather, erosion, safety concerns), rock, gravel, or additional culverts would be installed by the applicant. All drainage ditches and culverts would be maintained, keeping them clear of trash, free-flowing, and serviceable. If loose road surfacing material or additional structures are needed to maintain the access routes, the affected road segments would be identified for BLM approval and all work would be completed as specified by the BLM.

2.2.2 PIPELINES

The existing pipeline right-of-way, UTU-73643, is 94,950 feet long and 50 feet wide. A portion of right-of-way is in Asphalt Wash adjacent to Asphalt Wash Road on the west side of the road.

Gas Pipeline Upgrade

Utah Gas Corporation would replace 12,740 feet of the existing 4-inch surface gas pipeline with a 10-inch surface gas pipeline in the 50-foot width of the amended right-of-way (see Figure 2-2 below). The existing pipeline would be left in place until the proposed pipeline upgrade was complete, then would be removed. The pipeline upgrade would be buried at all road crossings and be constructed in adherence with BLM Technical Note 423 (BLM, 1988) at all wash crossings. The pipeline upgrade would be constructed on the existing road and be placed from the road using booms. The existing 4-inch pipeline would be cut and lifted out of the right-of-way. The cut pieces then would be hauled off by truck and trailer.

Flow Line

Anschutz Exploration Corporation would install 55 feet of surface flow line, up to a 10-inch diameter, in a corridor with a construction width of 100 feet and a permanent width of 30 feet. The flow line would be buried under Asphalt Wash Road. The flow line would go from the well pad on the east side of the road, to the proposed pipeline upgrade on the west side of the road (see Figure 2-1).

Lay Flat Waterline

The applicant would install 44,352 feet (8.4 miles) of a temporary ≤ 12 -inch surface lay flat waterline for completion and flow back operations (see Figure 2-3 below). It would tie into approved temporary lay flat-water line right of way (UTU95983). The lay flat waterline would be laid in the borrow ditches of the existing Uintah County claimed Class B roads, so no additional surface disturbance would occur. It would be installed once drilling commences, and be removed when the wells are completed and flow back operations are complete (approximately 10 months

2.2.3 WATER USED

Approximately 528 acre-feet of water (66 acre-feet per well) would be used during drilling, completions, equipment testing (e.g., hydrostatic testing of pipelines), and dust control. The water would be obtained from the following water sources, Water Right # 49-2398, Water Right # 49-2445, Water Right # 49-2449, and/or Water Right # 49-2452.

Drilling fluids including salts and chemicals would be contained in the closed-loop system. The drilling fluids and other produced water would be hauled to one of the following state approved disposal facilities: Piceance Creek Disposal Facility, Ace Oil Field Disposal, Wary Gulch land Fill, and/or Lapoint CD Landfill.

2.2.4 RECLAMATION

Within six months of drilling and completion termination, interim reclamation would begin on areas not needed for ongoing well production operations such as unused areas of the well pad and topsoil piles. Of the 28.6 acres of initial surface disturbance, 21.4 acres would be reclaimed in the interim, leaving 7.2 acres of long-term surface disturbance. During interim reclamation, the disturbed areas would be stabilized so that surface runoff flows and gradients resemble

conditions prior to development or to contours that blend in with the surrounding area. Topsoil would be evenly spread over the location, prepped, and seeded. Prior to commencement of seeding operations, the seedbed would be prepared by ripping compacted soils to a depth of eighteen (18) inches and disking on the contour to a depth of four (4) to six (6) inches.

Final well pad reclamation would begin within six months of well plugging and abandonment of the last well on the pad. The buried portions of proposed pipelines would be reclaimed immediately upon construction completion. For final reclamation, all disturbed surfaces (including the proposed access roads and well pad) would be re-contoured to approximate the original ground contour. No depression would be left where water could pond, with the following exceptions: micro-depressions created to support reclamation success, terminal storm water containment designed to silt in over time, and other storm water/snow storage basins.

Seed mixtures would be certified weed-free and would be applied at a rate of 15.5 PLS pounds per acre. Once the topsoil was replaced, seeding would occur generally between August 15 and ground freeze-up. If fall seeding were not feasible and erosion control was needed, as a second resort seeding would occur between spring thaw and May 15. The applicant would monitor the site annually and seeding would not be applied to wet or frozen ground. Seeding would only take place when the soils are dry and friable. Certified weed-free seed mixtures and mulches would be used, thereby minimizing the potential for noxious weed introduction.

2.2.5 WEED TREATMENT PLAN

The applicant would treat all noxious and invasive weeds on the well pad, along the road, and in pipeline corridors for the life of the project. The applicant would comply with all county/state weed laws and noxious weed control programs during the duration of the project. Treatments would be applied annually, be monitored by the applicant, and continue until desired vegetation out-competes any invasive or noxious weeds.

The applicant would use herbicide; the type would depend on the target species and the application would be timed to coincide with the growth stage(s) during which the herbicide would be most effective. Herbicides would be applied by certified personnel using approved precautionary and application procedures in compliance with all applicable federal, state, and local regulations. Herbicides would not be used within 100 feet of water or during windy conditions. Aerial application of herbicides would be prohibited within 0.25 mile of known special status plant species locations and hand application of herbicides would not occur within 500 feet of such occurrences.

Mowing may be implemented prior to seed head establishment or bloom.

2.2.6 APPLICANT-COMMITTED ENVIRONMENTAL PROTECTION MEASURES

The applicant has committed to implement the following measure(s) to reduce the extent or magnitude of potential environmental effects from the Proposed Action:

- To minimize erosion, the applicant would reinforce the north and west sides of the proposed pad with rock or jersey barriers to protect the topsoil piles and pad during precipitation events with high water and potential flooding.
- To minimize dust, the applicant in the second phase of drilling would apply magnesium chloride, or a similar product, to the running surface of the roads.
- To minimize noise impacts, the applicant would ensure that all engines would have an operational muffler system. The decibel level would not exceed seventy (70) decibels at a distance of 200 feet from the exhaust of any muffler.
- To minimize visual impacts, the applicant would paint permanent above ground structures, not subject to safety considerations, Carlsbad Canyon.
- To minimize impacts to Asphalt Wash, the Utah Gas Corporation would follow the standards stated in BLM Technical Note 423 Hydraulic Consideration for Pipelines Crossing Stream Channels.

2.3 ALTERNATIVE C – ALTERNATE PIPELINE ROUTE

Under this Alternative 9,275 feet (72%) of the 10-inch surface gas pipeline would be installed on the east side of Asphalt Wash Road for. All other aspects would be the same as the Proposed Action (Alternative B) in features and disturbance totals (see Figure 2-2). This Alternative would place the pipeline outside of the White River BLM Natural Area. Once south of the BLM Natural Area, the pipeline would cross under Asphalt Wash Road to the road's west side. The pipeline would then follow the existing pipeline right of way to the tie-in point.

2.4 ALTERNATIVES DISMISSED

2.4.1 CONSTRUCTING THE PROPOSED FLOWLINE ENTIRELY ON THE EAST SIDE OF ASPHALT WASH

This Alternative is a variation of Alternative C. In this Alternative, the proposed flow line would not cross Asphalt Wash Road south of the BLM Natural Area. Instead, it would continue to follow the east side of the road until its tie-in point. It also would require Utah Gas Corp to submit a new application and obtain a new right of way. This Alternative was dismissed from detailed analysis because it would have substantially similar effects to Alternative C, which is analyzed.

2.4.2 USING RECYCLED WATER FROM NEARBY PRODUCTION

In their public comments, the EPA requested that the BLM analyze the feasibility of using recycled water instead of river water for the Drumlin project. The BLM considered having the operator haul water from nearby producing wells. The BLM determined that using water from nearby producing wells is technically infeasible because the existing wells' current water production volume and rates are too low (approximately 0.1 acre feet per month) to produce the volumes needed within the timeframe needed to facilitate completions of even a single well. Completion operations require that per well, 66 acre-feet of water needs to be available within a 4-to-6-day window. In addition, even if the nearby wells did produce enough water it would need to be treated before use, which means hauling it to a treatment facility first.

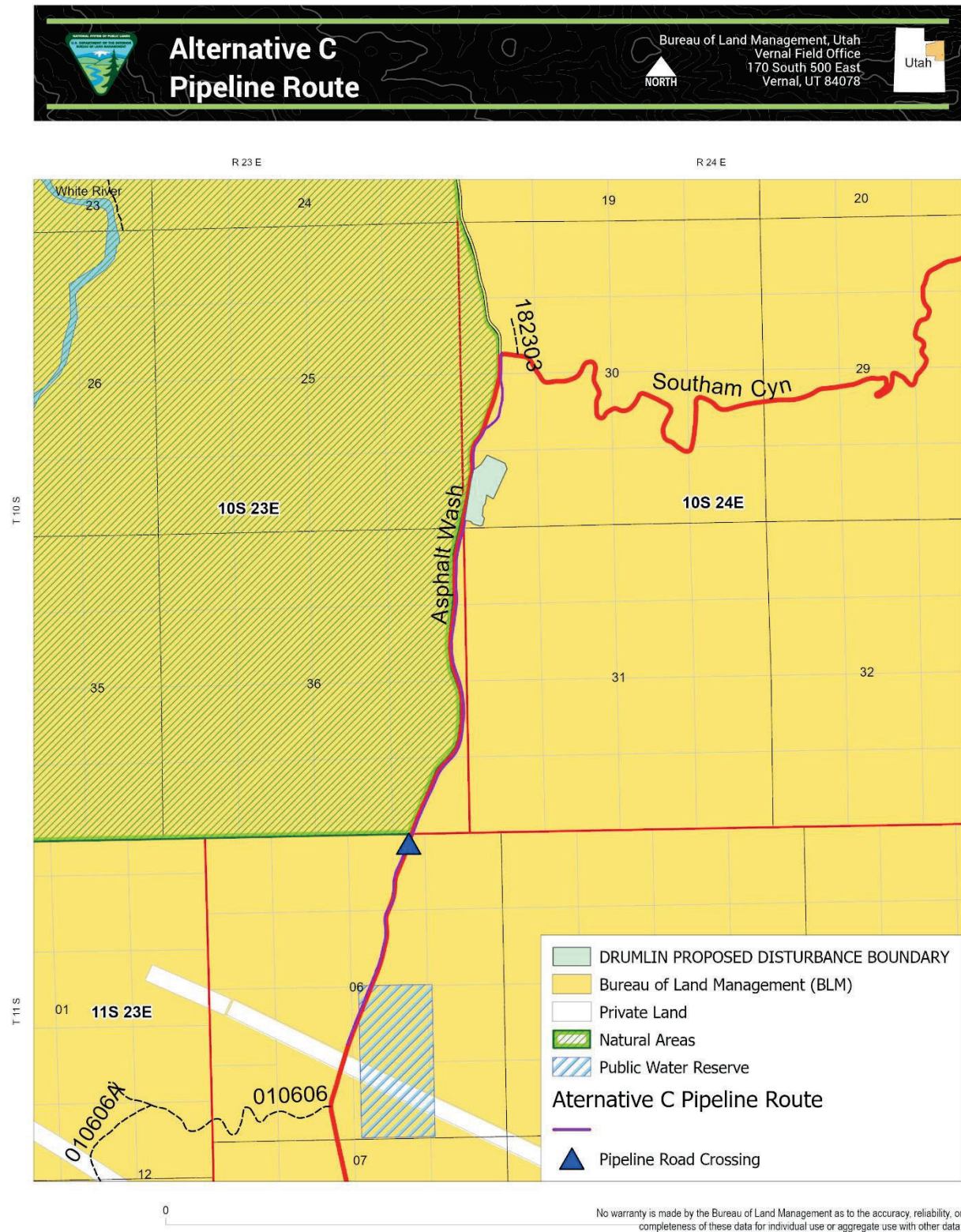


Figure 2-4 Alternative C Pipeline Route

2.4.3 USING RECYCLED WATER FROM A WATER TREATMENT FACILITY

In their public comments, the EPA requested that the BLM analyze the feasibility of using recycled water instead of river water for the Drumlin project. The BLM considered having the operator haul water from a treatment facility. Only one water treatment facility is located near Vernal Utah, and it is focused on providing primarily drinking water. This water recycling facility is located approximately 57 miles (one way) from the Drumlin pad and would require approximately 27,540 water truck trips to provide the 528 acre-feet of water need to complete the eight Drumlin wells. This Alternative was dismissed because it is ineffective (doesn't meet the purpose and need). That number of truck trips on dirt roads would result in unacceptable air quality (particulate matter and tailpipe) emissions.

2.4.4 DEFERRING ALL OF DRUMLIN PENDING OUTCOME OF THE LEASE LITIGATION

During the public comment period, the public proposed the BLM consider deferring all of the Drumlin project pending the outcome of the lease litigation. Under this Alternative, the BLM would defer the entire Drumlin project pending the outcome of the litigation against the leases. This Alternative variation was dismissed from detailed analysis because it is substantially the same as the No Action Alternative, which discloses the impacts that occur from not drilling the wells.

2.4.5 DEFERRING FOUR DRUMLIN APDS

During the public comment period, the public proposed the BLM consider deferring four APDs. Although the comment didn't specify, given the context the BLM assumes the preference is to defer the APDs with litigated leases: the Drumlin Fed 10-24-30-6-15 MCH, Drumlin Fed 10-24-30-6-16 MCH, Drumlin Fed 10-24-30-24-1 MCH, and Drumlin Fed 10-24-30-24-2 MCH.

This Alternative was dismissed from detailed analysis because it is substantially the same as the other Alternative s. Under this Alternative, the well pad, road, pipelines, and facilities would still be built so all the surface-related impacts would remain the same as the Proposed Action Alternative. The air and water impacts from the four deferred wells would not occur which is the same as the No Action Alternative. The air and water impacts from the four remaining wells would be the same per well air emissions and water consumption, and half the total disclosed in the Proposed Action.

The BLM notes that this Alternative is not required by the litigation because the litigation does not include a stay for the litigated leases (the leases remain in effect during the litigation). This Alternative is not required by policy because Permanent Instruction Memorandum 2022-001 outlines BLM's process for analyzing Applications on a litigated lease. Finally, this Alternative would not meet the purpose and need of the unit agreement.

3.0 ENVIRONMENTAL EFFECTS

3.1 HOW WOULD EMISSIONS FROM THE PROPOSED EQUIPMENT, WELL DRILLING, AND PRODUCTION IMPACT AIR QUALITY IN THE UINTA BASIN?

3.1.1 AFFECTED ENVIRONMENT

The project is located in the Uinta Basin, a semiarid, mid-continental climate regime characterized by dry and windy conditions, limited precipitation, and wide seasonal temperature variations with abundant sunshine and rapid nighttime cooling. The Uinta Basin contains rich deposits of hydrocarbons and has been subject to mineral extraction for many decades. There are multiple active oil and gas fields in the Uinta Basin containing thousands of producing wells. The spatial scope of this analysis was identified as Uintah and Duchesne Counties (the counties that overlap the Uinta Basin) to accommodate the regional nature of air pollution and to facilitate analysis using the best available air quality monitoring data, which is generally provided at the county level. Areas in Duchesne and Uintah Counties below 6,250 feet in elevation are designated as nonattainment (marginal) of the Ozone (O₃) National Ambient Air Quality Standard (NAAQS) by the Environmental Protection Agency (EPA) under the Clean Air Act effective 3 August 2018 (EPA 2018). Under the Clean Air Act, starting August 2019, the BLM is required to make a general conformity determination for reasonably foreseeable emissions that would result from the action (40 CFR 93.153.k).

Criteria Air Pollutants

The EPA has established NAAQS for six common air pollutants (also known as "criteria air pollutants" or CAPs). CAPs include carbon monoxide (CO), nitrogen dioxide (NO₂), O₃, particulate matter (PM₁₀ and PM_{2.5}), (SO₂), and lead (EPA 2023e). These pollutants are found all over the U.S. and are considered harmful to human health and the environment. A detailed description of these pollutants, along with their health effects and their sources can be found on pages 6 -10 of the BLM Utah Air Monitoring report (AMR) (BLM 2023a). Periodically, the EPA reviews the latest science to ensure that NAAQS appropriately protect human health and safety and to update the standards when necessary. Indicators for assessing environmental impacts from criteria air pollutants include emissions (mass per unit of time) and concentrations (mass per volume, or number of molecules over total molecules).

The EPA's criteria air pollutants website lists the NAAQS standards (EPA 2023a). The EPA's Air Quality Design Values webpage lists the Design Value Reports used for making NAAQS compliance determinations (EPA 2023b). Compliance with the NAAQS is typically demonstrated by monitoring for ground-level atmospheric air pollutant concentrations. Design values for Uintah and Duchesne Counties compared with the NAAQS are reported in table 3-1.

Table 3-1. 2021-2023 Criteria Air Pollutant Design Values.

Pollutant	County	Averaging Time	Concentration ¹	NAAQS	Percent of NAAQS
O ₃	Uintah	8-hour	0.076 ppm	0.070 ppm	108.6%
O ₃	Duchesne	8-hour	0.077 ppm	0.070 ppm	110.0%
NO ₂	Uintah	Annual	5 ppb	53 ppb	9.4%
NO ₂	Uintah	1-hour	31 ppb	100 ppb	31.0%
NO ₂	Duchesne	Annual	8 ppb	53 ppb	15.1%
NO ₂	Duchesne	1-hour	39 ppb	100 ppb	39.0
PM _{2.5}	Uintah	Annual	6.3 µg/m ³	9 µg/m ³	70.0%
PM _{2.5}	Uintah	24-hour	22 µg/m ³	35 µg/m ³	62.9%
PM _{2.5}	Duchesne	Annual	7.0 µg/m ³	9 µg/m ³	77.8%
PM _{2.5}	Duchesne	24-hour	27 µg/m ³	35 µg/m ³	77.1%

Source: EPA 2023b, retrieved from <https://www.epa.gov/air-trends/air-quality-design-values>

¹Concentrations in parts per million (ppm), parts per billion (ppb), microgram per cubic meter (µg/m³).

Since O₃ is formed via photochemical reactions between Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOC), emissions of these pollutants are of particular concern in the Uinta Basin. The current design value for the Uinta Basin is above the O₃ NAAQS (2021-2023 design value of 0.077 ppm) (EPA 2024b). However, EPA has issued a draft rule concluding that the Uinta Basin has attained the standard for O₃ by the attainment date (August 3, 2023) but this does not change the airshed status to attainment. Continued periods of high O₃ levels in the Uinta Basin may still be observed, even though the area has been shown to attain the standard. Therefore, continued efforts and commitments are needed to reduce precursor emissions in the region (EPA 2024a).

Even though the Duchesne County PM₁₀ design value is violating the NAAQS, the estimated exceedances are only from the year 2022, and changes in attainment status are not anticipated since the years 2021 and 2023 showed no exceedances.

The National Emissions Inventory (NEI)⁴ is a comprehensive and detailed estimate of air emissions containing criteria pollutants and criteria precursors. The NEI is released every three years based primarily upon data provided by State, Local, and Tribal air agencies for sources in their jurisdictions and supplemented by data developed by the US EPA. The most recent reporting year for the NEI is 2020. Emissions inventories relevant to the analysis area are listed below (Table 3-2). County level emissions include both natural (e.g., wildfires and biogenic) and anthropogenic (e.g., fuel combustion, mobile, etc.) sources. Uintah and Ouray Reservation emissions include anthropogenic stationary sources only.

⁴ <https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data>

Table 3-2. 2020 Criteria Air Pollutant Emissions (Tons/Year)

Area	PM ₁₀	PM _{2.5}	VOC	NO _x	CO	SO ₂
Duchesne County	43,732.34	33,701.97	117,570.24	10,022.30	408,171.15	2,557.38
Uintah County	6,000.12	1,253.08	58,108.20	8,644.35	13,635.98	137.11
Uintah and Ouray Reservation	555.68	444.53	329.97	4,597.29	405.26	765.71
Uinta Basin Total	50,288.14	35,399.58	176,008.41	23,263.94	422,212.39	3,460.20

Source: The National Emissions Inventory (accessed 08/22/24).

Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are known or suspected to cause cancer or other serious health effects, such as reproductive effects, birth defects, or adverse environmental impacts. The EPA has classified 188 air pollutants as HAPs. Examples of listed HAPs associated with the oil and gas industry include formaldehyde, benzene, toluene, ethyl benzene, isomers of xylene (BTEX compounds), and normal-hexane (n-hexane). Indicators for assessing environmental impacts from HAPs include emissions (mass per unit of time) and concentrations (mass per volume).

Emissions of HAPs are included as part of the NEI. Total HAPs emissions relevant to the analysis area are listed in Table 3-3.

Table 3-3. 2020 NEI Hazardous Air Pollutant Emissions (Tons/Year)

Area	Total Emissions (TPY)	Vegetation and Soils (TPY)	Wildfire (TPY)	Prescribed Fire (TPY)	Oil and Gas Production (TPY)
Duchesne County	21,914.21	1,604.72	18,933.88	4.58	1171.81
Uintah County	4871.89	2,410.69	16.35	10.05	2,257.42 ¹
Uinta Basin Total	26,786.10	4,015.41	18,950.23	14.63	3429.23 ¹

Source: The National Emissions Inventory (accessed 08/22/24).

¹ Includes oil and gas sources from Uintah and Ouray Reservation.

The CAA requires the EPA to regulate emissions of toxic air pollutants from a published list of industrial sources referred to as “source categories.” The EPA has developed a list of source categories that must meet control technology requirements for these toxic air pollutants. Under Section 112(d) of the CAA, the EPA is required to develop regulations establishing national emission standards for hazardous air pollutants (NESHAP) for all industries that emit one or more of the pollutants in major source quantities. These standards are established to reflect the maximum degree of reduction in HAP emissions through application of maximum achievable control technology (MACT). Source categories for which MACT standards have been implemented include oil and natural gas production and natural gas transmission and storage.

The EPA AirToxScreen was used to evaluate impacts from existing HAP emissions in Utah (EPA 2023d). AirToxScreen results for counties relevant to the analysis area are reported in Table 3-4. The total cancer risk is within the acceptable range of risk published by the EPA of 100 in 1 million as discussed in the National Contingency Plan, 40 CFR 300.430. Hazard index

(HI) values less than one mean it is unlikely that air toxics would cause adverse non-cancer health effects over a lifetime of exposure.

Table 3-4. Total Cancer Risk and Non-Cancer Hazard index from Existing HAP Emissions (2019 Reporting Year).

County	Total Cancer Risk/Million	Background Cancer Risk/Million	Oil & Gas Cancer Risk/Million	Hazard Index*
Duchesne	15.89	2.60	5.16	0 to 0.13
Uintah	12.75	2.63	1.32	0 to 0.13

Source: EPA's AirToxScreen.

*HI is reported as the range of all target organ HIs presented in AirToxScreen.

Air Quality Related Values

Air pollution can impact Air Quality Related Values (AQRVs) through ambient exposure to elevated atmospheric concentrations, such as O₃ effects to vegetation, impairment of scenic views by PM in the atmosphere, and deposition of air pollutants, such as sulfur and nitrogen compounds on the earth's surface through dry and wet deposition. AQRVs are identified and managed within the respective jurisdictions of several land management agencies in designated Class I areas (U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service, 2010). The Prevention of Significant Deterioration (PSD) is a Clean Air Act permitting program for new or modified major sources of air pollution located in attainment areas. It is designed to prevent NAAQS violations, preserve and protect air quality in sensitive areas, and protect public health and welfare⁵ (EPA 2022c). Under PSD regulations, the EPA classifies airsheds as Class I, Class II, or Class III. Each of these classes have different applicable thresholds for evaluating air quality and AQRV impacts which, in turn, require different air quality assessment methods. The nearest Class I areas to the project area are Arches National Park to the south, Flat Tops Wilderness to the east, and Bridger Wilderness to the north. Current visibility and deposition conditions and trends throughout the state of Utah, including areas near the analysis area, are included on pages 32-36 of the AMR (BLM 2023a).

3.1.2 ALTERNATIVE A (NO ACTION) ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, no potential impacts to air quality would occur because no new emissions of pollutants would occur. However, Federal production levels are expected to remain static or even increase in the short-term and non-Federal oil and gas supply would likely increase if the wells were not developed.

3.1.3 ALTERNATIVE B (PROPOSED ACTION) ENVIRONMENTAL CONSEQUENCES

The Proposed Action would result in different emission sources associated with well development and well production. Well development would include activities such as well pad

⁵ <https://www.epa.gov/nsr/prevention-significant-deterioration-basic-information>

and pipeline construction and drilling and completion of the wells. Emissions from development activities would include NO_x, SO₂, and CO tailpipe emissions from construction equipment, vehicle traffic, drilling, and completion equipment. Fugitive dust (PM₁₀ and PM_{2.5}) emissions would occur from vehicle traffic on unpaved roads, construction equipment, and from wind erosion where soils are disturbed. Drill rig and fracturing engine operations would result mainly in NO_x and CO emissions, with lesser amounts of SO₂. These emissions would be short-term during the drilling and completion phases.

During well production, NO_x, CO, VOC, and HAP emissions would originate from well pad separators, storage tank vents, stationary engines, pneumatic devices, other production equipment, and fugitive emissions from components. PM₁₀ and PM_{2.5} would be produced by operational vehicles visiting and servicing the wells and production haul out. NO_x and VOC emissions (O₃ precursor pollutants) for the Proposed Action would be dispersed and/or diluted to the extent where any local O₃ impacts would be indistinguishable from background conditions.

Development of the wells would take place over three years involving two separate phases. During phase one only two wells would be developed in the first year. If the wells are determined to be successful, then phase two would commence in which the remaining wells (up to six) would be developed over the remaining two years. For this analysis, phase two emissions were assumed to occur in the second year of development. The applicant has committed to apply a chemical dust suppressant (e.g., magnesium chloride) with a control efficiency of at least 84% on public dirt roads used to access the well pad during phase two of the Proposed Action. Therefore, PM₁₀ and PM_{2.5} emissions from fugitive dust would be expected to be less during phase two than phase one, even though fewer wells would be drilled during phase one. Estimated emissions from the Proposed Action (Table 3-5) were calculated using the Emissions and Modeling Impacts Tool (EMIT) utilizing emission factors from EPA's AP-42 and MOVES model, and company provided inputs. More information on how emissions were estimated can be found in the EMIT User's Guide (BLM 2024). After the wells have been constructed and drilled, only operation emissions would occur on an annual basis. Future year operational annual emissions would be less based on production decline of the wells.

Table 3-5. NAAQS Proposed Action Emissions.

	Total Emissions (Tons/Year)						
	PM ₁₀	PM _{2.5}	VOC	NO _x	CO	SO ₂	Total HAPs
Phase one (two wells)¹							
Development	19.85	3.61	5.71	46.88	34.93	1.73	0.72
Operation	15.39	1.91	10.32	15.39	23.25	0.05	1.08
Total	35.25	5.51	16.03	62.26	58.18	1.77	1.80
Phase two (six wells)^{2, 3}							
Development	7.74	5.31	16.80	138.10	103.13	5.18	2.11
Operation	8.55	1.98	30.97	46.16	69.75	0.14	3.23
Total	16.29	7.29	47.78	184.26	172.88	5.31	5.34
Total Project (eight wells)							
Development	27.59	8.92	22.51	184.98	138.06	6.91	2.83
Operation	23.94	3.88	41.30	61.55	93.00	0.18	4.31
Total	51.53	12.80	63.81	246.52	231.06	7.09	7.14
Source: The Emissions and Modeling Impacts Tool (EMIT). 1 – Phase one emissions would occur in year one of development. 2 – Phase two emissions were assumed to occur in year two of development. 3 – Actual annual emissions during phase two would be less based on the general conformity review present in Section 3.1.3.1.							

A 2019 health assessment study completed by Colorado State University (CSU) (ICF and CSU 2019) during various stages of well development and production at oil and gas extraction facilities in Colorado found that chemical air concentrations for VOCs (including HAPs) and associated exposure levels decreased rapidly with distance. Simulated chronic cancer risks over a lifetime of exposure for average individuals were below one in one million at distances of 1,400 feet from the well pads, four in one million at 500 feet from the well pads, and ten in one million at 300 feet from the well pads. Fewer than one in one million people at distances of 2,000 feet from the well pads experienced the worst potential long-term combination of individual risk factors, oil and gas emissions, and local meteorological conditions (maximum exposed individual). This figure rises to seven in one million at 500 feet from the well pads, and ten in one million at 400 feet from the well pads (ICF and CSU 2019). Although the sources and types of HAPs for the Proposed Action would likely differ from that of the aforementioned study, the same trend of a decrease in HAPs concentrations with increased distance from the well pad could be expected. The project area is located in an oil/gas field greater than 5 miles from the nearest houses or residential buildings. There are several other active wells within one mile of the proposed wells for this action.

Emissions of CAPs and HAPs would also occur outside the planned area from transport, processing, distribution, and end-use. Generally, crude oil from the Uinta Basin is trucked to refineries in Salt Lake City, or to the Price River Terminal in Wellington, Utah. Crude oil offloaded at the Price River Terminal is transported via railway to refineries throughout the country which produce a multitude of refined products. Refineries in Utah produce mostly gasoline, diesel fuel, and jet fuel. Products from Utah's refineries are transported via pipeline to markets in Utah, Idaho, Nevada, Wyoming, eastern Washington, and Oregon (EIA 2022). Regarding natural gas, Utah is crossed by several interstate pipelines that transport natural gas from the Opal Hub in Wyoming, from the Piceance Basin in western Colorado, and from Utah's in-state production to markets in Nevada, Idaho, and Colorado (EIA 2022).

Since combustion of all petroleum products emit CAPs and HAPs, local ambient concentrations of these pollutants could increase in areas where products from the Uinta Basin (oil and gas) are combusted. This could contribute to an area exceeding either national or local air quality standards. Air quality involves complex physical and chemical transformations at a local/regional level, so impacts would vary considerably depending on background concentrations, meteorology, and other local pollutant sources. If any pollutant concentration is near or above its standard in a particular area, the combustion of oil and gas products could contribute to or exacerbate nonattainment. Potential pollutant concentration change resulting from combustion is therefore often a key driver of public policy to mitigate air quality and public health impacts in such areas. Downstream combustion and end uses are regulated by the EPA or delegated to state agencies. This regulatory process is designed to avoid downstream impacts to regional and local air quality.

3.1.3.1 GENERAL CONFORMITY REVIEW

Section 176(c) of the Clean Air Act requires Federal agencies' actions to conform to applicable implementation plans for attaining and maintaining the NAAQS. The Proposed Action would occur within the Uinta Basin 8-hour O₃ Non-attainment Area (NAA). NAAs are designated by EPA and State regulatory agencies as having monitored criteria pollutant concentrations that exceed the NAAQS. Federal actions (i.e., application for permit to drill (APD) permitting) occurring within NAAs are subject to the Clean Air Act's General Conformity Rule.

For there to be conformity, a federal action must not cause or contribute to any new violation of any standard in any area, increase the frequency or severity of any existing violation of any standard in any area, or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The Uinta Basin O₃ NAA is classified as marginal (EPA 2018) and is outside of an O₃ transport region. Thus, the de minimis limit that applies for each O₃ precursor (NO_x and VOC) is 100 tons per year (40 C.F.R. 93.153(b)(1)). If total emission increases attributable to the Federal action are below de minimis levels, then the action is presumed to conform. Federal agencies approving actions with emissions below the de minimis limits for each NAA pollutant or precursor are not required to provide a formal conformity determination for the project, as the project is presumed to not interfere with the area's timely attainment of the NAAQS.

Under the general conformity regulations, emissions sources that are subject to new source review permitting are exempt from the general conformity requirements (40 C.F.R. 93.153(d)(1)). In the Uinta Basin, sources permitted through Utah Administrative Code R307-500 series or the Federal Implementation Plan (FIP) for Managing Emissions from Oil and Natural Gas Sources on Indian Country Lands Within the Uintah and Ouray Indian Reservation in Utah (87 FR 75334) would qualify as exempt. Utah Administrative Code R307 504-511 permits by rule tank truck loading, storage vessels, dehydrators, VOC control devices, well site natural gas-fired engines, and gas flaring. These emissions sources as described in the code are not subject to general conformity review. The FIP for Managing Emissions from Oil and Natural Gas Sources on Indian Country Lands Within the Uintah and Ouray Indian Reservation in Utah permits storage tanks, dehydrators, pneumatic pumps/controllers, covers and closed-vent

systems, VOC control devices, fugitive emissions, truck loading, and other combustion devices. These emissions sources as described in the FIP are not subject to general conformity review.

The project proponent would obtain an air permit for stationary sources (e.g., tanks, stationary engines, fugitive emissions, etc.) operating under this Proposed Action. Potential emissions from permitted sources have been excluded from the emissions totals that are compared to the de minimis limits for each NAA pollutant or precursor for this analysis. The proponent would develop the wells in two phases. During phase one only two wells would be drilled annually. During phase two the remaining six wells would be drilled over two years. The proponent would not develop more than four wells annually on the well pad. For General Conformity purposes, only the maximum year emissions scenario (four wells annually) was analyzed.

The maximum annual development and production of NO_x and VOC emissions from the Proposed Action applicable to general conformity review would be 95.48 and 12.79 tons/year respectively. These values would be below the general conformity de minimis limit of 100 tons/year. Therefore, no further analysis of these emissions is required for General Conformity purposes, and the project would meet conformity.

3.1.3.2. EMISSIONS CONTROL MEASURES

Best Management Practices (BMPs)⁶ are designed to reduce emissions from field production and operations. These BMP measures are applied to oil and natural gas drilling and production to help minimize impacts to air quality through reduction of emissions, surface disturbances, and dust from field production and operations. The BLM encourages oil and natural gas companies to adopt other proven, cost-effective technologies and practices that improve operational efficiency and reduce emissions.

- All internal combustion equipment would be kept in good working order.
- Water or other approved dust suppressants would be used, as determined appropriate by the Authorized Officer.
 - A combination of dust control techniques (e.g., chemical stabilizers and reducing vehicle speed to 25 miles per hour or less on unpaved roads (WRAP 2006)) with a combined proven control efficiency of at least 84% would be used on public dirt roads used to access the well pad during phase two of development.
- Open burning of garbage or refuse would not occur at well sites or other facilities.
- Drill rigs would be equipped with Tier II or better diesel engines.
- Telemetry would be installed to remotely monitor and control production.

⁶ <https://deq.utah.gov/sbeap/best-management-practices-for-the-oil-and-gas-industry>
<https://www.epa.gov/natural-gas-star-program>
<https://archive.epa.gov/airquality/community/web/html/oil-gas.html>
<https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/the-gold-book>

- All new and replacement internal combustion gas field engines of less than or equal to 300 design-rated horsepower must not emit more than 2 grams of NO_x per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower-hour.
- All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 grams of NO_x per horsepower-hour.
- The operator would not increase annual development on the well pad above what has been evaluated for general conformity purposes (four wells per year max).

3.1.4 ALTERNATIVE C ENVIRONMENTAL CONSEQUENCES

Air quality impacts under Alternative C would be the same as those analyzed in the Proposed Action (Alternative B) since the total number of proposed wells and surface disturbance would remain the same among both Alternatives.

3.1.5 CUMULATIVE IMPACTS

Cumulative impacts for air quality are the result of the incremental impacts from the Proposed Action when added to other past, present, and reasonably foreseeable future actions. Past and present actions that have affected and would likely continue to affect air quality in the analysis area include surface disturbance resulting from ongoing oil and gas development and associated infrastructure, geophysical exploration, ranching, and livestock grazing, range improvements, recreation (including OHV use), authorization of rights of ways (ROWs) for utilities and other uses, and road development. Past and present actions that have affected and would likely continue to affect air quality are too numerous to list here but would include the development or conversion of power plants; the development of energy sources such as oil and gas; the development of highways and railways; and the development of various industries that emit pollutants. These types of actions and activities can reduce air quality through emissions of criteria pollutants including fugitive dust, VOCs, and HAPs, as well as contribute to deposition impacts and to a reduction in visibility.

To assist in airshed management the BLM has at times utilized air quality modeling. Modeling is based on reasonably foreseeable development. Products from modeling analysis are used for cumulative impacts analysis and source apportionment impact analysis (i.e. impacts from Federal versus non-federal emissions). There are three general categories of air quality models used: near-field models, far-field models, and photochemical models. Near-field models are primarily used to evaluate project level emissions that are likely to result in local air quality impacts at transport distances less than 50km. To analyze cumulative impacts from multiple emissions sources, the BLM uses far-field models with photochemical capabilities. There are three primary air quality modeling studies used in this document to evaluate potential cumulative air quality impacts, the BLM Regional Modeling Study, the Utah ARMS model, and the WRAP/WAQS Regional Haze model.

The main purpose of this BLM Regional Air Modeling Study (Ramboll 2023) is to understand the regional air quality and air quality related value impacts of oil and gas development and coal mining in the federal mineral estate and assess federal contributions in relation to non-federal and other cumulative emission sources in these regions. The study covers the western U.S. with

focus on states where the BLM commonly authorizes federal activities for fossil energy development, namely Utah, Colorado, New Mexico, Wyoming, Montana, North Dakota and South Dakota. The model evaluated air quality out to a future year of circa 2032. Data from WRAP/WAQS Regional Haze Model, the EPA's 2016v2 emissions modeling platform (US EPA 2022d), and data from the BLM was used to apportion Federal and non-federal oil and gas emissions. Cumulative HAPs modeling has also been performed using the circa 2032 scenario.

The BLM prepared the ARMS regional modeling study (BLM 2020a) to evaluate foreseeable changes to air quality and AQRVs from oil and gas activity in Utah, and specifically ozone episodes within the Uinta Basin. ARMS projected oil and gas emissions for Low and High development scenarios using the UDAQs Uinta Basin Oil and Gas Emissions Model. Source apportionment is used in the modeling study to evaluate changes to air quality and AQRVs from all sources including biogenic sources, BLM Uinta Basin Oil and Gas sources, other oil and gas sources (including BLM authorized sources outside Duchesne and Uintah Counties), and non-oil and gas anthropogenic sources (including oil and gas combustion from mobile and stationary sources). The contributions of BLM oil and gas development emissions in Utah to air quality and AQRVs at Utah Class I and Class II sites and at sensitive lakes are compared against the NAAQS, PSD increment concentrations, and visibility and deposition thresholds of concern.

The WRAP/WAQS Regional Haze modeling (WRAP/WAQS, 2021) was performed to help member states show that reasonable progress is being made toward natural visibility conditions to be achieved by 2064. The model uses source apportionment to isolate the contributions of U.S. anthropogenic emissions, along with other sources (e.g., International anthropogenic emissions, fires and natural sources), to visibility extinction at monitoring sites representing Class I areas in the western U.S. This allows for the estimation of the changes in visibility impairment due to U.S. anthropogenic emissions at Class I areas over time and whether they are trending toward no impairment due to U.S. anthropogenic emissions by 2064.

CAPs, HAPs, and AQRV results from the aforementioned modeling studies are included in the AMR report (BLM 2023a) and are incorporated by reference and summarized below (see pages 42 - 59 in the AMR).

Criteria Air Pollutants

In general, cumulative concentrations for all modeled criteria pollutants in the BLM Regional Air Model showed concentrations that did not lead to any violation of the NAAQS across Utah except for PM_{2.5} and PM₁₀. Any exceedance of the PM_{2.5} and PM₁₀ NAAQS occurred due to wildfires, as wildfires were the largest contributor to modeled PM_{2.5} and PM₁₀ concentrations. The BLM Regional Air Model showed that sources outside of Utah have a large contribution to the maximum O₃ concentrations in Utah. Excluding out of state sources, the other anthropogenic sources (i.e., those not including oil, gas, or coal source groups), followed by the natural source group (fires, biogenic emissions, etc.) are the highest contributors to O₃ concentrations. The largest oil and gas contributions are from the non-federal sources followed by the federal sources from other states. Among the coal source groups, the contributions are from the energy generating unit (EGU) combustion sector. The largest contributions to 1-hour NO₂ were due to the other anthropogenic sources followed by the natural source group, coal combustion in EGUs, wildfires and federal oil and gas development sources outside Utah. The largest contributions to

SO₂ concentrations were due to wildfires, followed by other anthropogenic source groups and coal combustion from EGUs. Source apportionment for CO was not implemented in the model and therefore was not reported as part of the analysis. There were no exceedances of CO 1-hour maximum and 8-hour average concentrations across the state. Locations with maximum CO concentrations also had PM₁₀ peaks due to wildfires; indicating that wildfires were likely responsible for the high CO concentrations too.

The BLM Regional Air Model Study used 12 km grid spacing for emissions, meteorology, and topography. While this grid spacing was sufficient for evaluating regional air quality issues that may affect large areas, it may not accurately predict smaller scale air quality issues such as geographically and meteorologically trapped wintertime ozone. The BLM ARMS model, which had a grid spacing of 4 km was used to evaluate local scale air quality impacts from oil and gas activity in Utah. The ARMS model showed potential exceedances of the O₃ NAAQS along the Wasatch Front and in the Uinta Basin. O₃ exceedances along the Wasatch Front were mainly due to non-oil and gas anthropogenic sources. Exceedances in the Uinta Basin were mainly due to oil and gas sources (Federal and non-Federal oil and gas development). Modeled O₃ showed decreasing concentrations between the base year and future year model run. The ARMS impact analysis results indicated that air impacts of emissions from projected oil and gas development activities under BLM jurisdiction in Uintah and Duchesne Counties for both High and Low Development Scenarios were strongly confined to the Uinta Basin and did not contribute to the long-range transport of impacts outside of the Basin. The BLM oil and gas development emissions contributed 8.88% (up to 5 ppb) to the total simulated daily 8-hour maximum O₃ concentrations in the Uinta Basin under the high oil and gas production scenario and contributed less than 0.01 percent to simulated daily 8-hour maximum O₃ outside the Uinta Basin.

The Proposed Action would contribute the percentages presented in table 3-6 to the total CAPs emissions in Uintah and Duchesne Counties.

Table 3-6. Contribution of the Proposed Action's Total Emissions to Current Total CAPs Emissions in Uintah and Duchesne Counties.

Pollutant	CO	NO _x	PM ₁₀	PM _{2.5}	SO ₂	VOC
Percent contribution	0.05%	1.06%	0.10%	0.04%	0.20%	0.04%

Hazardous Air Pollutants

Using the BLM circa 2032 air quality modeling platform, an additional model analysis was performed for HAPs (Ramboll and BLM 2023). The results of this HAPs modeling study provide an assessment of the cumulative health effects of specific HAPs originating from oil and gas production. A photochemical model was used to estimate the cumulative ambient air concentrations of six HAPs (benzene, toluene, ethylbenzene, xylenes, n-hexane, and formaldehyde) resulting from emissions from federal and non-federal oil and gas sources. These six HAPs were selected by BLM for study as they are subject to emissions standards (New Source Performance Standards [NSPS] and National Emissions Standards for Hazardous Air Pollutants [NESHAPs]) regulated for the oil and gas sectors.

The health-based inhalation thresholds used in the BLM HAPs modeling study were the same as those used in EPA's AirToxScreen (EPA, 2023d). The modeled HAPs long-term (annual) concentrations were assessed for cancer risk and noncancer effects from inhalation for the study region from the three modeled oil and gas production source groups (existing Federal, new Federal, and total non-Federal). Lifetime cancer risks for each pollutant were calculated based on the modeled concentrations. Total lifetime cancer risk from the exposure to three HAPs (benzene, ethylbenzene, and formaldehyde) were calculated by summing the individual cancer risks for each pollutant. Chronic noncancer hazards from multiple air toxics were assessed by calculating a HI.

A residency exposure adjustment factor was applied by taking the average residency of the counties in the Uinta Basin (Table 3-7) and dividing that by length of exposure over an assumed 70-year life span. For example, for Uintah County, the residency exposure adjustment factor would be 12.4/70. All other values in the following tables are raw model output with no adjustment applied.

Table 3-7. County Specific Residency Information.

County	Uintah	Duchesne
Residency period (years)	12.4	14.5
Source: Estimate based on data from U.S. Census Bureau (USCB), 2022, 2017-2021 American Community Survey 5-Year Estimates, Table S2502 Demographic Characteristics for Occupied Housing Units, https://data.census.gov/table/ACSST5Y2021.S2502 .		

Table 3-8 shows the oil and gas cancer risk from federal sources (existing and projected) and from all mineral designations together from the combination of benzene, ethylbenzene, and formaldehyde. The risk analysis was performed only for the three HAPs (benzene, ethylbenzene, and formaldehyde) because these pollutants had EPA-provided non-zero unit risk estimate values based on the weight of evidence approach (EPA 2021). Total cancer risk is below the 100 in 1 million cumulative threshold, indicating no substantial risks from oil and gas production.

Table 3-8. Estimated Cancer Risk (per million) from Circa 2032 Oil and Gas Production by Mineral Designation.

County	Cancer Risk* from Existing Federal Wells	Cancer Risk * from Projected New Federal Wells	Cancer risk* from Non- Federal Wells	70-Year Cancer Risk* from Cumulative Oil and Gas Production	Adjusted Cancer Risk** from Cumulative Oil and Gas Production
Uintah	0.12 to 5.24	0.11 to 15.2	0.16 to 9.35	0.38 to 29.79	0.07 to 5.23
Duchesne	0.05 to 1.13	0.05 to 1.76	0.08 to 5.02	0.18 to 7.46	0.04 to 1.54
*Cancer risk from emissions of benzene, ethylbenzene, and formaldehyde.					
**Adjusted risk based on residency factors by county (see table 3-6)					

It is important to note that the cancer risks estimated by this assessment only consider cumulative oil and gas sources and six common oil and gas HAP pollutants. While the cumulative oil and gas contribution is within the contextual range published by EPA (1 in 1 million and 100 in 1 million), additional HAPs from non-oil and gas sources could increase the overall risk in the project area.

Table 3-9 shows the Hazard Quotients (HQs) for each compound and the HI. EPA estimates chronic noncancer HQs by dividing a chemical's estimated long-term exposure concentration by

the reference concentration for that chemical. Chronic noncancer hazards from multiple air toxics were assessed by calculating a HI through the summation of individual HAP HQs that share similar adverse health effects, resulting in a target organ-specific HI representing the risk to a specific organ or organ system. An HQ or HI value less than 1 indicates that the exposure is not likely to result in adverse noncancer effects. (Ramboll and BLM 2023, EPA 2022e). Uintah and Duchesne Counties show HQ and HI values below 1 for all mineral designations, indicating that cumulative oil and gas source exposure is not likely to result in adverse noncancer effects. The maximum HI from total oil and gas production is also below 1 for both counties. It is important to note that the noncancer risks estimated by this assessment only consider cumulative oil and gas sources and the six common oil and gas pollutants. While the cumulative oil and gas contribution are below 1, additional HAPs from non-oil and gas sources could increase the overall risks in the project area.

Table 3-9. Estimated Hazard Quotients and Hazard Index from Circa 2023 Oil and Gas Production by Mineral Designation.

Source	Hazard Quotient						Hazard Index
	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Formaldehyde	
Uintah County							
Existing Federal	<0.0001 to 0.0044	Range is <0.0001	<0.0001 to 0.0001	<0.0001 to 0.0007	<0.0001 to 0.0005	0.0009 to 0.033	0.0009 to 0.0382
Projected Federal	0.0001 to 0.0376	<0.0001 to 0.0003	<0.0001 to 0.0059	0.0001 to 0.0864	<0.0001 to 0.0161	0.0006 to 0.0154	0.0008 to 0.1620
Total Federal	0.0001 to 0.042	<0.0001 to 0.0003	<0.0001 to 0.0059	0.0001 to 0.0867	<0.0001 to 0.0166	0.0014 to 0.0484	0.0017 to 0.2002
Non-Federal	0.0001 to 0.0204	<0.0001 to 0.0001	<0.0001 to 0.0027	<0.0001 to 0.04	<0.0001 to 0.0078	0.001 to 0.0198	0.0012 to 0.0909
Total Oil and Gas	0.0002 to 0.0624	<0.0001 to 0.0004	<0.0001 to 0.0086	0.0001 to 0.1267	<0.0001 to 0.0244	0.0025 to 0.0682	0.0029 to 0.2911
Duchesne County							
Existing Federal	<0.0001 to 0.002	Range is <0.0001	Range is <0.0001	<0.0001 to 0.0001	<0.0001 to 0.0002	0.0004 to 0.006	0.0004 to 0.0077
Projected Federal	0.0001 to 0.0047	Range is <0.0001	<0.0001 to 0.0002	<0.0001 to 0.0026	<0.0001 to 0.0009	0.0004 to 0.0041	0.0004 to 0.0123
Total Federal	0.0001 to 0.0062	Range is <0.0001	<0.0001 to 0.0002	<0.0001 to 0.0026	<0.0001 to 0.0010	0.0007 to 0.0101	0.0007 to 0.02
Non-Federal	0.0001 to 0.015	Range is <0.0001	<0.0001 to 0.0002	<0.0001 to 0.0031	<0.0001 to 0.0013	0.0006 to 0.0124	0.0006 to 0.0296
Total Oil and Gas	0.0001 to 0.0212	Range is <0.0001	<0.0001 to 0.0004	<0.0001 to 0.0052	<0.0001 to 0.0023	0.0013 to 0.225	0.0013 to 0.0468

The Proposed Action would contribute to HAP emissions in the analysis area. However, an increase in HAPs emissions related to the Proposed Action would not be anticipated to cause a substantial change to cumulative HAPs impacts since the total cancer and non-cancer risks in both Uintah and Duchesne Counties are well within the contextual range published by EPA. Further, the Proposed Action's total HAPs emissions would contribute to 0.03 percent of the total HAPs emissions in Uintah and Duchesne Counties.

Air Quality Related Values

Visibility

The Regional Haze Rule requires states to demonstrate progress every ten years toward the Clean Air Act goal of no manmade visibility impairment. WRAP/WAQS conducted photochemical grid model source apportionment modeling to develop the U.S. anthropogenic emissions rate of progress analysis to estimate the rate that visibility impairment due to U.S. anthropogenic emissions is being reduced over time. To help assess whether a Class I area is on a path toward the regional haze long-term goal, the trends in the Interagency Monitoring of Protected Visual Environments (IMPROVE) most impaired days visibility are compared against the uniform rate of progress glidepath that is obtained as a straight-line trend in visibility (in dv) from the measured IMPROVE most impaired days from the 2000-2004 Baseline to 2064 natural conditions. Future year (2028) visibility projections are made at IMPROVE sites representing Class I areas using modeling results for comparison against the uniform rate of progress glidepath. Trends and model projections at or below the glidepath line indicate that the Class I area is on track to meeting long-term visibility goals. Figures 17-19 in the AMR show that Bryce Canyon, Canyonlands/Arches National Park, Capitol Reef National Park, and Zion National Park are all on track to meet these goals.

Table 29 in the AMR shows the cumulative visibility design values projected by the BLM Regional Air Model for circa 2032. Areas with the highest cumulative values were Zion National Park, Canyonlands National Park and Arches National Park. These projected visibility design values for the most impaired days are below the uniform rate of progress glidepath 2064 visibility goals, and below the WRAP/WAQS Regional Haze Model projected 2028 visibility design values.

For the most impaired days, the contributions of natural sources were small, while wildfires' contributions range between 1% and 13%. The contributions from oil and gas sectors to visibility impacts were relatively small with the contributions from states outside Utah showing the largest impacts (2%) at Mesa Verde NP. Existing Federal oil and gas contributions are less than 1%. Among the coal source groups, coal EGUs affect Class I areas the most, with contributions between 1 and 5%. Impacts from other anthropogenic sources (both inside and outside the state) have impacts between 15% and 26%. This is not unexpected given the large number of urban and industrial emissions typically associated with this group. The maximum impact from this sector occurs at Arches National Park.

Deposition

Cumulative annual Nitrogen deposition over the Utah analysis area varied between 0.6 and 4.5 kg N/ha. Deposition values are less than 4 kg N/ha throughout most of Utah. In general, the largest contributors to nitrogen deposition are other anthropogenic sources followed by boundary conditions, natural source groups and wildfires. Contributions from wildfires have isolated impacts between 0 and 0.5 kg N/ha within Utah. Existing and new Federal oil and gas sources within the BLM Green River District have impacts of less than 0.4 kg N/ha and 0.1 kg N/ha respectively. The contribution of oil and gas sources in the rest of Utah is less than this. The contributions from both federal and non-federal coal mine sources are less than 0.1 kg N/ha.

Nitrogen deposition from other anthropogenic sources varies between 0.3 and 3.8 kg N/ha in Utah.

Cumulative annual sulfur deposition over Utah varies between 0.01 and 1.1 kg S/ha within Utah. In general, the largest contributors to sulfur deposition are other anthropogenic sources followed by coal combustion in EGUs, boundary conditions, and wildfires. Contributions from wildfires range from 0 to 0.1 kg S/ha. Existing and new federal oil and gas development in the Green River District show contribution near zero, while Federal oil and gas sources in the rest of Utah shows small impacts ranging from 0.01 and 0.25 kg S/ha. EGU coal combustion is the largest coal contributor with maximum annual deposition of 1 kg S/ha. Other coal combustion shows impacts between 0.01 and 0.25 kg S/ha. The contributions from both federal and non-federal coal mines are less than or equal to 0.1 kg S/ha.

In summary, cumulative impacts to AQRVs in the impact analysis area are anticipated to be maintained at current levels or projected to improve. Visibility is generally predicted to be steady or improving at national parks near the project area. Nitrogen deposition conditions at national parks near the project area range from poor to fair with no trend (where trend data is available), and sulfur deposition conditions are good and have either no trend or are improving (where trend data is available) (BLM 2023a).

3.2 HOW WOULD EMISSIONS FROM THE PROPOSED EQUIPMENT, WELL DRILLING, AND PRODUCTION CONTRIBUTE TO GREENHOUSE GASES AND CLIMATE CHANGE?

3.2.1 AFFECTED ENVIRONMENT

Climate change is a global process that is affected by the sum total of GHGs in the Earth's atmosphere. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component. GHGs influence the global climate by increasing the amount of solar energy retained by land, water bodies, and the atmosphere. GHGs can have long atmospheric lifetimes, which allows them to become well mixed and uniformly distributed over the entirety of the Earth's surface no matter their point of origin. The buildup of these gases has contributed to the current changing state of the climate equilibrium towards warming.

Further discussion of climate change science and predicted impacts as well as the reasonably foreseeable and cumulative GHG emissions associated with BLM's oil and gas actions are included in the 2022 BLM Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends (BLM 2023b) (hereinafter referred to as the Annual GHG Report). This report presents the estimated emissions of greenhouse gases attributable to development and consumption of fossil fuels produced on lands and mineral estate managed by the BLM. The Annual GHG Report is incorporated by reference as an integral part of this analysis and is available at <https://www.blm.gov/content/ghg/2022>.

A discussion of past, current, and projected future climate change impacts is described in Chapters 4, 8, and 9 of the Annual GHG Report. These chapters describe currently observed

climate impacts globally, nationally, and in each State, and present a range of projected impact scenarios depending on future GHG emission levels.

The incremental contribution to global GHGs from a single proposed land management action cannot be accurately translated into its potential effect on global climate change or any localized effects in the area specific to the action. Currently, global climate models are unable to forecast local or regional effects on resources resulting from a specific subset of emissions. However, there are general projections regarding potential impacts on natural resources and plant and animal species that may be attributed to climate change resulting from the accumulation of GHG emissions over time. In this EA, the BLM uses GHG emissions as a proxy for impacts and provides context with other proxies such as GHG equivalents and the social cost of GHGs.

For the purposes of this EA, the projected emissions from the Proposed Action can be compared to modeled emissions that have been shown to have definitive or quantifiable impacts on the climate in order to provide context of their potential contribution to climate change. Table 3-10 shows the total estimated GHG emissions from fossil fuels at the global, national, state, and county scales over the last six years. Emissions are shown in megatonnes (Mt) per year of carbon dioxide equivalent (CO₂e). Chapter 3 of the Annual GHG Report contains additional information on GHGs and an explanation of CO₂e. State and national energy-related CO₂ emissions include emissions from fossil fuel use across all sectors (residential, commercial, industrial, transportation, and electricity generation) and are released at the location where the fossil fuels are consumed.

Additional information on current state, national, and global GHG emissions as well as the methodology and parameters for estimating emissions from BLM fossil fuel authorizations and cumulative GHG emissions is included in the Annual GHG Report (see Chapters 5,6, and 7).

Table 3-10. Global and U.S. Fossil Fuel GHG Emissions 2016 - 2021 (Mt CO₂e/yr)

Scale	2016	2017	2018	2019	2020	2021
Global (CO₂ only)	36,256.0	36,890.3	37,831.9	37,824.9	35,944.5	38,082.2
U.S.	4909.9	4,852.5	4,989.8	4,855.9	4,344.9	4,639.1
State	58.1	58.2	60.0	60.4	56.7	NA
Duchesne and Uintah Counties*	3.541	3.970	3.961	4.041	3.516	3.239
Source: Annual GHG Report, Chap. 5, Table 5-1 (U.S.) and Table 5-2(State). Global emissions (CO ₂ only) from the Emissions Database for Global Atmospheric Research (EDGAR) 2023 Report - https://edgar.jrc.ec.europa.eu/report_2023?vis=co2tot#emissions_table Mt (megatonne) = 1 million metric tons NA = Not Available * - County level data only includes major industrial sources that emit over 25,000 metric tons CO ₂ e/yr as reported in EPA's Facility Level Information on Greenhouse Gases Tool (EPA 2023) - https://ghgdata.epa.gov/ghgp/						

3.2.2 ALTERNATIVE A (NO ACTION) ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, no direct or indirect GHG emissions would occur. However, the national and global demand for energy is not expected to differ regardless of BLM decision-making.

The BLM does not have a model to estimate energy market substitutions at a spatial resolution needed for onshore production. Reductions in oil and natural gas produced from the Proposed Action may be partially offset by non-Federal production (state and private) in the United States (in which case the indirect GHG emissions would be similar), or overseas, in which case the GHG emissions would likely be higher, to the extent environmental protection requirements for production are less vigorous, and the produced energy would need to be physically transported into the United States. There may also be substitution of other energy resources to meet energy demand. These substitution patterns will be different for oil and gas because oil is primarily used for transportation, while natural gas is primarily used for electricity production and manufacturing, and to a lesser degree by residential and commercial users (EIA 2023). Coal and renewable energy sources are stronger substitutes for natural gas in electricity generation. The effect of substitution between different fuel sources on indirect GHG emissions depends on the replacement energy source. For example, coal is a relatively more carbon intense fuel than natural gas and hydroelectricity is the least carbon intense energy source (see Table 10-3 of the Annual GHG Report (BLM 2023b)). In the transportation sector, Alternatives to oil are likely to be less carbon intensive.

Finally, substitution across energy sources or oil and gas production from other locations may not fully meet the energy needs that would otherwise have been realized through production from the Proposed Action. Price effects may lower the market equilibrium quantity demanded for some fuel sources. This would lead to a reduction in indirect GHG emissions. These three effects are likely to occur in some combination under the No Action Alternative, but the relative contribution of each is unknown. Regardless, GHG emissions under the No Action Alternative are not expected to be zero.

3.2.3 ALTERNATIVE B (PROPOSED ACTION) ENVIRONMENTAL CONSEQUENCES

The Proposed Action would lead to emissions of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), the three most common GHGs associated with oil and gas development. These GHG emissions would be emitted during well development and operations, and from the end-use consumption of any fluid minerals that may be produced. However, the BLM cannot reasonably determine before development the amount of fluid mineral that would be extracted. For the purposes of this analysis, the BLM has evaluated the potential effects of the Proposed Action on climate change by analyzing potential GHG emissions from the proposed development using estimates based on past oil and gas development available from existing development within the State.

There are four general stages of development that would generate GHG emissions: 1) well development (well site construction, well drilling, and well completion), 2) well production operations (extraction, separation, gathering), 3) mid-stream (refining, processing, storage, and

transport/distribution), and 4) end-use (combustion or other uses) of the fuels produced. While well development and production operation emissions (stages 1 and 2) occur on-site and the BLM has program authority over these activities, mid-stream and end-use emissions (stages 3 and 4) typically occur off-site where the BLM has no program authority. Although the applicant would develop the wells in two separate phases (see Section 2.2), GHG emissions in this analysis are reported for the total development of up to eight wells.

The amount of oil or gas that may be produced from the wells is unknown. For purposes of estimating production and end-use emissions, wells are assumed to produce oil and gas in similar amounts as existing nearby wells. While the BLM has no authority to direct or regulate the end-use of the products, for this analysis, the BLM assumes all produced oil or gas would be combusted (such as for domestic heating or energy production). The BLM acknowledges that there may be additional sources of GHG emissions along the distribution, storage, and processing chains (commonly referred to as midstream operations) associated with production from the proposed wells. These sources may include emissions of methane (a more potent GHG than CO₂ in the short term) from pipeline and equipment leaks, storage, and maintenance activities. These sources of emissions are highly speculative at the permitting stage, therefore, the BLM has chosen to assume that mid-stream emissions associated with the proposed wells for this analysis would be similar to the national level emissions identified by the Department of Energy's National Energy Technology Laboratory (NETL, 2009) (NETL, 2019). Section 6 of the Annual GHG Report includes a more detailed discussion of the methodology for estimating midstream emissions.

The emission estimates calculated for this analysis were generated using the assumptions previously described above in the BLM Lease Sale Emissions Tool. Maximum year emissions were estimated based on the maximum annual development scenario of four wells annually. For this analysis it was assumed that two wells would be developed year one, four wells would be developed year two, and two wells would be developed year three. Emissions are presented for each of the four development phases described above.

- Well development emissions occur over a short period and may include emissions from heavy equipment and vehicle exhaust, drill rig engines, completion equipment, pipe venting, and well treatments such as hydraulic fracturing.
- Well production operations, mid-stream, and end-use emissions occur over the entire production life of a well, which is assumed to be 30 years for this analysis based on the productive life of a typical oil/gas field.
- Production operation emissions may result from storage tank breathing and flashing, truck loading, pump engines, heaters and dehydrators, pneumatic instruments or controls, flaring, fugitives, and vehicle exhaust.
- Mid-stream emissions occur from the transport, refining, processing, storage, transmission, and distribution of produced oil and gas. Mid-stream emissions are estimated by multiplying the estimated ultimate recovery (EUR) of produced oil and gas with emissions factors from NETL life cycle analysis of U.S. oil and natural gas. Additional information on emission factors can be found in the Annual GHG Report (Chapter 6, Table 6-8 and 6-10).

- For the purposes of this analysis, end-use emissions are calculated assuming all produced oil and gas is combusted for energy use. End-use emissions are estimated by multiplying the EUR of produced oil and gas with emissions factors for combustion established by the EPA (Tables C-1 and C-2 to Subpart C of 40 CFR § 98). Additional information on emission factors and EUR factors can be found in the Annual GHG Report (Chapter 6).

Table 3-11 shows the estimated maximum year and average year GHG emissions over the life of the wells for both 100-yr and 20-yr global warming potentials (GWP). Section 3.4 of the Annual GHG Report provides a detailed explanation of GWP.

Table 3-11. Estimated Direct and Indirect Emissions from the Wells on an Annual and Life of Well Basis (tonnes)

	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e (20-yr)
Max Year (year 2)	822,709	1,843.84	3.439	878,594	975,765
Average Year	146,475	349.13	0.535	157,024	175,423
Life of Wells	4,687,185	11,172.03	17.104	5,024,781	5,613,547
Source: BLM Lease Sale Emissions Tool					

Table 3-12 lists the estimated direct (well development and production operations) and indirect (mid-stream and end-use) GHG emissions in metric tonnes (t) for the Proposed Action over the average 30-year production life of the wells. In summary, potential GHG emissions from the Proposed Action could result in GHG emissions of 5,024,781 t CO₂e over the life of the wells.

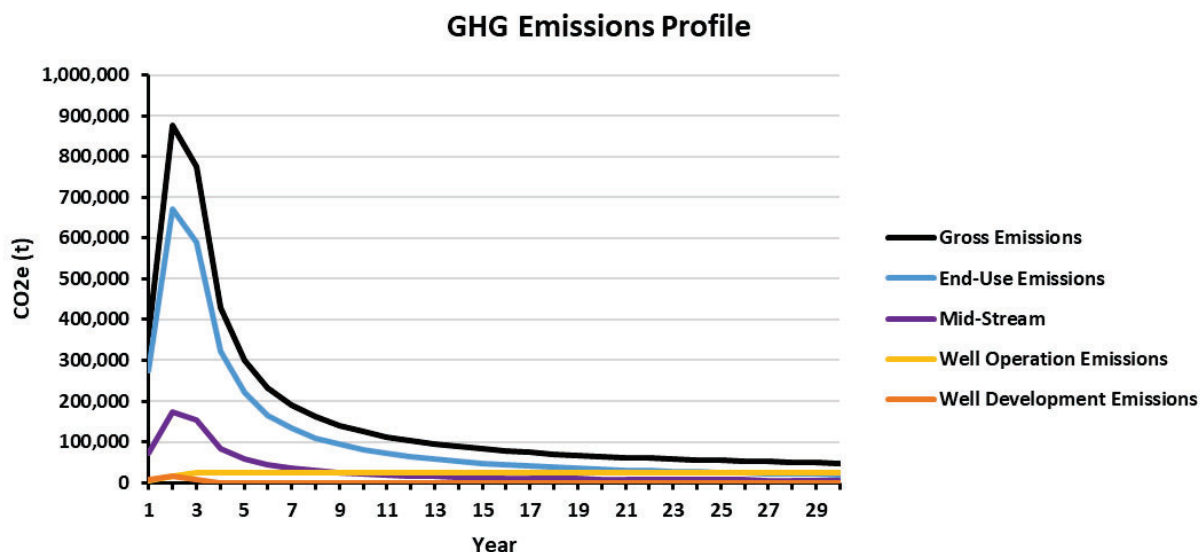
Table 3-12. Estimated Life of Well Emissions from Well Development, Well Production Operations, Mid-stream, and End-use (tonnes)

Activity	CO ₂	CH ₄	N ₂ O	CO ₂ e (100-yr)	CO ₂ e (20-yr)
Well Development	33,213	34.02	0.538	34,374	36,167
Well Production Operations	630,813	2,081.15	0.552	692,983	802,659
Mid-Stream	616,513	8,989.00	8.540	886,716	1,360,437
End-Use	3,406,646	67.86	7.473	3,410,708	3,414,284
Total	4,687,185	11,172.03	17.104	5,024,781	5,613,547
Source: BLM Lease Sale Emissions Tool					

GHG emissions vary annually over the production life of a well due to declining production rates over time.

Figure 3-1 shows the estimated GHG emissions profile over the production life of the wells including well development, well production operations, mid-stream, end-use, and gross (total of well development, well production, mid-stream, and end-use) emissions.

Figure 3-1. Estimated GHG Emissions Profile over the Life of The Wells



Source: BLM Lease Sale Emissions Tool

To put the estimated GHG emissions for this Proposed Action in a relatable context, potential emissions that could result from development of the wells can be compared to other common activities that generate GHG emissions. The EPA GHG equivalency calculator (EPA 2022a) can be used to express the potential average year GHG emissions on a scale relatable to everyday life (<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>). For instance, the projected average annual GHG emissions from development of the 8-well Proposed Action are equivalent to 33,841 gasoline-fueled passenger vehicles driven for one year, or the emissions that could be avoided by operating 43 wind turbines as an alternative energy source or offset by the carbon sequestration of 186,934 acres of forest land.

Table 3-13 compares the estimated annual emissions from the proposed wells to existing Federal fossil fuel (oil, gas, and coal) emissions, State, and U.S. total GHG emissions.

Table 3-13. Comparison of the Proposed Action's Emissions to Other Sources (Megatonnes)

Reference	Mt CO ₂ e ¹ (Per Year)
Proposed Wells Emissions (Maximum Year)	0.88
UT Onshore Federal (Oil & Gas) ²	13.9
UT Total (Oil, Gas, and Coal) ²	41.35
U.S. Onshore Federal (Oil & Gas) ²	542.06
U.S. Federal-All (Oil & Gas) ²	933.87
U.S. Federal Onshore (Oil, Gas and Coal) ²	1,033.21
U.S. Total (Oil, Gas, and Coal) ²	6,899.49

1 – Mt (megatonne) = 1 million metric tons. Estimates are based on 100-GWP values.
2 – Federal values come from the BLM Specialist Report on Annual Greenhouse Gas Emissions, Tables ES-1 and ES-2. U.S Federal-All includes offshore and onshore oil and gas production.

3.2.3.1 SOCIAL COST OF GREENHOUSE GASES

The “social cost of carbon”, “social cost of nitrous oxide”, and “social cost of methane” – together, the “social cost of greenhouse gases” (SC-GHG), are estimates of the monetized damages associated with incremental increases in GHG emissions in a given year. This subsection provides estimates of the monetary value of changes in GHG emissions that could result from the Proposed Action. Such analysis should not be construed to mean a cost determination is necessary to address potential impacts of GHGs associated with specific alternatives. While these numbers provide a monetized measure of the net harm to society from emissions, they do not constitute a complete cost-benefit analysis of management actions under considerations and do not present a direct comparison with other impacts discussed in this document. SC-GHG estimates are provided only as a useful measure of the benefits of GHG emissions reductions to inform agency decision-making.

The best currently available estimates of the SC-GHG for use in Department of Interior decision-making and/or analysis are those cited in the Environmental Protection Agency’s Final Rule of March 8, 2024, 89 Fed. Reg. 16820, 17018-20. These estimates reflect recent advances in the scientific literature on climate change and its economic impacts and incorporate recommendations made by the National Academies of Science, Engineering, and Medicine (National Academies 2017).¹ Technical documentation and additional supporting documents regarding these estimates are available on the EPA webpage (EPA 2024f).

The EPA’s SC-GHG estimates were developed using complex models which simulates how changes in GHG emissions may affect global temperatures, sea level rise, and other biophysical processes; how these changes may affect human health and infrastructure, as well as the supply of energy, food, and water; and monetize the market and nonmarket impacts associated with these effects. The modular approach employed by EPA to estimate the SC-GHG also includes a discounting module which discounts the stream of future net climate damages back to the year when the additional unit of emissions was released. EPA discounts the future costs of emissions to the emission year using three different near-term target rates (1.5%, 2.0%, and 2.5%) to reflect uncertainty over the starting rate. A higher discount rate assumes that future benefits or costs are more heavily discounted than benefits or costs occurring in the present (i.e., future benefits or costs are a less significant factor in present-day decisions).

The SC-GHGs associated with estimated emissions from the Proposed Action are reported in Table 3-14. These estimates represent the present value of future market and nonmarket costs associated with CO₂, CH₄, and N₂O emissions, discounted to 2024 by applying a constant discount rate equal to the near-term target rate to discount costs from the emissions year. Estimates are calculated using EPA’s Workbook and based on BLM’s estimates of emissions in each year. They are rounded to the nearest \$1 million.

Table 3-14. SC-GHG Associated with Development of the Wells (present value)

	Social Cost of All GHG Emission Changes (millions, 2023 \$)		
	2.5% near-term Ramsey discount rate	2.0% near-term Ramsey discount rate	1.5% near-term Ramsey discount rate
Development and Operations	\$96	\$158	\$273
Mid-Stream and End-Use	\$607	\$989	\$1,688
Total	\$703	\$1,147	\$1,961

Source: EPA-sc-ghg-workbook

3.2.3.2 EMISSIONS CONTROL MEASURES

The relationship between GHG emissions and climate impacts is complex, but a project's potential to contribute to climate change is reduced as its net emissions are reduced. When net emissions approach zero, the project has little or no contribution to climate change. Net-zero emissions can be achieved through a combination of controlling and offsetting emissions. Emission controls (e.g., vapor recovery devices, no-bleed pneumatics, leak detection and repair, etc.) can substantially limit the amount of GHGs emitted to the atmosphere, while offsets (e.g., sequestration, lower carbon energy substitution, plugging abandoned or uneconomical wells, etc.) can remove GHGs from the atmosphere or reduce emissions in other areas. Chapter 10 of the Annual GHG Report provides a more detailed discussion of GHG mitigation strategies.

Several Federal agencies work in concert to implement climate change strategies and meet U.S. emissions reduction goals all while supporting U.S. oil and gas development and operations. The EPA is the Federal agency charged with regulation of air pollutants and establishing standards for protection of human health and the environment. The EPA has issued regulations that will reduce GHG emissions from the Proposed Action. These regulations include the New Source Performance Standard for Crude Oil and Natural Gas Facilities (40 CFR 60, OOOOa), Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After November 15, 2021 (40 CFR 60, OOOOb), Emissions Guidelines for Greenhouse Gas Emissions from Existing Crude Oil and Natural Gas Facilities Constructed on or before December 6, 2022 (40 CFR 60, OOOOc), and Waste Emissions Charge for Petroleum and Natural Gas Systems (40 CFR 99). These regulations impose emission limits, equipment design standards, and monitoring requirements on oil and gas facilities and a waste emissions charge on methane emissions that exceed 25,000 metric tonnes of CO₂e for applicable petroleum and natural gas facilities currently required to report under the Greenhouse Gas Reporting Rule. A detailed discussion of existing regulations and Executive Orders that apply to BLM management of federal lands as well as current Federal and state regulations that apply to oil and gas development and production can be found in Chapter 2 of the Annual GHG Report.

The State of Utah also regulates GHG emissions from oil and gas facilities under the following rules: Administrative Code R307-500 Series which applies to all oil and natural gas exploration, production, and transmission operations; well production facilities; natural gas compressor stations; and natural gas processing plants in Utah. These rules require emissions control standards for pneumatic controllers, venting and flaring, tank truck loading, storage vessels, dehydrators, volatile organic compound (VOC) control devices, stationary natural gas engines, and leak detection and repair requirements.

The majority of GHG emissions resulting from federal fossil fuel authorizations occur outside of the BLM's authority and control. These emissions are referred to as indirect emissions and generally occur off-lease during the transport, distribution, refining, and end-use of the produced federal minerals. The BLM's regulatory authority is limited to those activities authorized under the APDs, which primarily occur in the "upstream" portions of natural gas and petroleum systems (i.e., the well-development and well-production phases). This decision authority is applicable when development is proposed on public lands and the BLM assesses the specific location, design and plan of development. In carrying out its responsibilities under NEPA, the BLM has developed Best Management Practices (BMPs) designed to reduce emissions from field production and operations. BMPs may include limiting emissions from stationary combustion sources, mobile combustion sources, fugitive sources, and process emissions that may occur during development of the wells. Approval of development may include the application of BMPs within BLM's authority, included as Conditions of Approval, to reduce or mitigate GHG emissions. Additional measures also may be incorporated as applicant-committed measures by the project proponent or added to necessary air quality permits. Additional information on mitigation strategies, including emissions controls and offset options, are provided in Chapter 10 of the Annual GHG Report.

3.2.4 ALTERNATIVE C ENVIRONMENTAL CONSEQUENCES

Contributions to GHGs and climate change under Alternative C would be the same as those analyzed in the Proposed Action (Alternative B) since the total number of proposed wells and surface disturbance would remain the same among both Alternatives.

3.2.5 CUMULATIVE IMPACTS

The analysis of GHGs contained in this EA includes estimated emissions from the Proposed Action as described above. An assessment of GHG emissions from other BLM fossil fuel authorizations, including coal leasing and oil and gas leasing and development, is included in Chapter 7 of Annual GHG Report. The Annual GHG Report includes estimates of reasonably foreseeable GHG emissions related to coal, oil, and gas development that is occurring, and is projected to occur, on the federal onshore mineral estate. It is, therefore, an estimate of cumulative GHG emissions from the BLM fossil fuel program based on actual production and statistical trends as they are presently known.

The methodologies used in the Annual GHG Report provide estimates of foreseeable short-term and projected long-term GHG emissions from activities across the BLM's oil and gas program. The foreseeable short-term methodology includes a trends analysis of (1) leased federal lands that are held-by-production⁷ (2) approved APDs, and (3) leased lands from competitive lease sales projected to occur over the next annual reporting cycle (12 months). The data is used to

⁷ [held-by-production](#) - A provision in an oil or natural gas property lease that allows the lessee to continue drilling activities on the property as long as it is economically producing a minimum amount of oil or gas. The held-by-production provision thereby extends the lessee's right to operate the property beyond the initial lease term.

provide a 30-year life of project projection of potential emissions from all Federal oil and gas activities and potential leasing actions over the next 12 months. The projected long-term methodology uses oil and gas production forecasts from the Energy Information Administration (EIA) to estimate GHG emissions out to 2050 that could occur from past, present, and future development of Federal fluid minerals. For both methodologies, the emissions are calculated using life-cycle-assessment data and emission factors. These analyses are the basis for projecting GHG emissions from lease parcels that are likely to go into production during the analysis period of the Annual GHG Report and represent both a hard look at GHG emissions from oil and gas development and the best available estimate of reasonably foreseeable cumulative emissions related to any one APD or set of APDs that could occur annually across the entire federal onshore mineral estate.

Table 3-15 presents the aggregate GHG emissions estimate that would occur from Federal oil and gas development and operations within the region, existing and foreseeable, between the years 2022 and 2050, using the methodology described above. A detailed explanation of the short-term and long-term emissions estimate methodologies are provided in Sections 6.6 and 6.7 of the Annual GHG Report.

Table 3-15. GHG Emissions from Regional Past, Present, and Reasonably Foreseeable Federal Onshore Development (Mt CO₂e)

State	Existing Wells (Report Year)	Existing Wells (Projected)	Approved APDs	New Leasing	Short-Term Foreseeable Totals	Long-Term Projected Totals
CO	46.16	399.35	30.80	23.95	454.10	1,395.90
MT	2.52	25.68	0.42	12.63	38.73	77.12
NV	0.13	1.01	0.01	0.19	1.22	4.07
NM	326.00	2,318.83	745.21	119.12	3,183.17	9,961.81
TX	3.31	36.52	19.00	1.97	57.49	99.95
UT	13.90	175.34	16.33	36.75	228.41	421.63
WY	103.34	920.76	178.16	317.98	1,416.91	3,134.55
Total Onshore Federal	542	4,334	1,123	576	6,033	16,523

Source: BLM Annual GHG Report, Section 7.

As detailed in the 2022 Annual GHG Report, which the BLM has incorporated by reference, the BLM also looked at other tools to inform its analysis, including the Model for the Assessment of Greenhouse Gas Induced Climate Change (MAGICC) (see Section 9.0 of the Annual GHG Report). BLM conducted MAGICC runs evaluating potential contributions to global climate change and related values for two climate change projection scenarios. These two scenarios were chosen because they most closely approximate or frame the desired outcomes of the Paris Climate Accord and would also reflect the greatest contribution as a percent of BLM's authorized cumulative emissions relative to the global emissions levels contained in the scenarios. IPCC's most optimistic scenario evaluates global CO₂ emissions cut to net zero around 2050. This is the only scenario that meets the Paris Agreement's goal of keeping global warming to around 1.5 degrees Celsius above pre-industrial temperatures. The second "middle of the road" scenario leaves global CO₂ emissions around current levels before starting to fall by 2050 but does not reach net-zero by 2100. In this scenario, temperatures rise 2.7 degrees C by the end of the

century. The maximum BLM fossil fuel (oil, gas, and coal) contribution to global temperature increases under these two scenarios is 0.015 C and 0.013 C, respectively.

Recent short-term energy outlook reports (STEO) published by the EIA (<https://www.eia.gov/outlooks/steo/>) (EIA 2024) predict that the world's oil and gas supply and consumption will increase over the next 18-24 months. The STEO projections are useful for providing context for the cumulative discussion as the global forecast models used for the STEO are not dependent on whether the BLM issues onshore leases or authorizes new APDs but are based on foreseeable short-term global supply and demand and include oil and gas development/operations on existing U.S. onshore leases. Recent STEOs include the following projections for the next two years:

- U.S. liquid fuels consumption is projected to increase to 20.40 million barrels per day (b/d) in 2024 up from 20.25 million b/d in 2023.
- U.S. crude oil production is expected to average 13.19 million b/d in 2024 and rise to 13.65 million b/d in 2025.
- U.S. natural gas consumption is expected to average 89.68 Bcf/d in 2024, decreasing slightly to 89.21 Bcf/d in 2025.
- U.S. LNG exports are expected to increase from 11.9 billion cubic feet/day (Bcf/d) in 2023 to 12.34 Bcf/d in 2024 and 14.43 Bcf/d in 2025.
- U.S. Coal production is expected to total 496.6 million short tons (MMst) in 2024 and 465.8 MMst in 2025 and decrease to 15% of total U.S. electricity generation in 2024 compared to 17% in 2023 driven by on-going retirement of coal-fired generating plants.

Generation from renewable sources will make up an increasing share of total U.S. electricity generation, rising from 21% in 2023 to 24% in 2024. Recent events, both domestically and internationally, have resulted in abrupt changes to the global oil and gas supply. EIA studies and recent U.S. analyses (associated with weather impacts, etc.) regarding short-term domestic supply disruptions and shortages or sudden increases in demand demonstrate that reducing domestic supply (in the near-term under the current supply and demand scenario) will likely lead to the import of more oil and natural gas from other countries, including countries with lower environmental and emission control standards than the United States (EIA 2024). Recent global supply disruptions have also led to multiple releases from the U.S. Strategic Petroleum Reserve in order to meet consumer demand and curb price surges.

The EIA 2023 Annual Energy Outlook (<https://www.eia.gov/outlooks/aeo/>) (EIA 2023) projects energy consumption increases through 2050 as population and economic growth outweighs efficiency gains. As a result, U.S. production of natural gas and petroleum and liquids will rise amid growing demand for exports and industrial uses. U.S. natural gas production increases by 15% from 2022 to 2050. However, renewable energy will be the fastest-growing U.S. energy source through 2050. As electricity generation shifts to using more renewable sources, domestic natural gas consumption for electricity generation is expected to decrease by 2050 relative to 2022. As a result, energy-related CO₂ emissions are expected to fall 25% to 38% below 2005 level, depending on economic growth factors. Further discussion of past, present and projected global and state GHG emissions can be found in Chapter 5 of the Annual GHG Report.

Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad" (January 27, 2021), directs the executive branch to establish policies or rules that put the United States on a path to

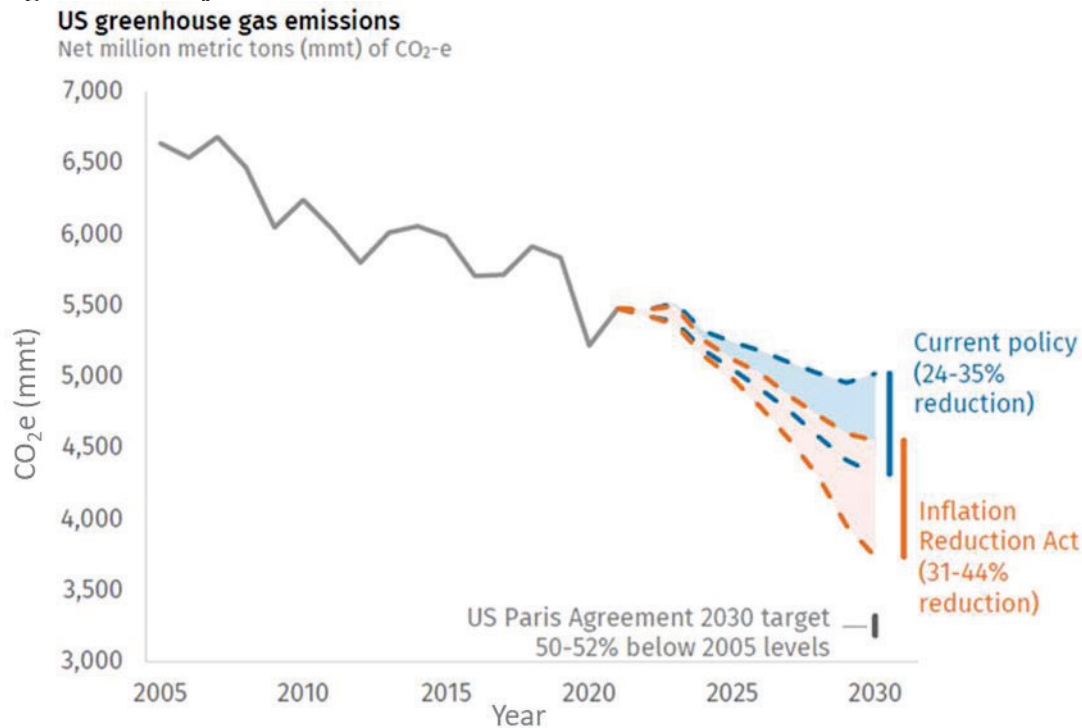
achieve carbon neutrality, economywide, by no later than 2050. This goal is consistent with IPCC's recommendation to reduce net annual global CO emissions between 2020 and 2030 in order to reach carbon neutrality by mid-century. Federal agencies are still in the process of developing policies that align with a goal of carbon neutrality by 2050. In the short-term, the order has a stated goal of reducing economy wide GHG emissions by 50% to 52% relative to 2005 emissions levels no later than 2030.

Carbon budgets are an estimate of the amount of additional GHGs that could be emitted into the atmosphere over time to reach carbon neutrality while still limiting global temperatures to no more than 1.5°C or 2°C above preindustrial levels (see Section 9.1 of the Annual GHG Report (BLM, 2023b)). The IPCC Special Report on Global Warming of 1.5°C is the most widely accepted authority on the development of a carbon budget to meet the goals of the Paris Agreement. None of the global carbon budgets or pledges that countries have committed to stay within as part of the Paris Agreement are binding. At present, no national or Federal agency carbon budgets have been established, primarily due to the lack of consensus on how to allocate the global budget to each nation, and as such the global budgets that limit warming to 1.5°C or 2.0°C are not useful for BLM decision making, as it is unclear what portion of the budget applies to emissions occurring in the United States.

The Council on Environmental Quality discourages Federal agencies from comparing emissions from an action to global or domestic levels as "such comparisons and fractions also are not an appropriate method for characterizing the extent of a Proposed Action's and its Alternatives' contributions to climate change because this approach does not reveal anything beyond the nature of the climate change challenge itself (CEQ 2023)." However, stakeholders and members of the public have requested that the BLM consider comparing the estimated Federal oil and gas emissions in the context of global carbon budgets. In the interest of public disclosure, Table 9-1 in the Annual GHG Report provides an estimate of the potential emissions associated with Federal fossil fuel authorizations in relation to IPCC carbon budgets. Total Federal fossil fuel authorizations including coal, natural gas and oil represents approximately 1.37 % of the remaining global carbon budget of 380 gigatonnes of CO₂ needed to limit global warming to 1.5 C.

While continued fossil fuel authorizations will occur over the next decade to support energy demand and remain in compliance with the leasing mandates in the Inflation Reduction Act (IRA) passed in 2022, the U.S. Energy Information Administration International Energy Outlook expects renewable energy consumption to double between 2020 and 2050 and nearly equal liquid fuels consumption by 2050. The U.S. has committed to the expansion of renewable energy through infrastructure investments in clean energy transmission and grid upgrades included in the Bipartisan Infrastructure Investment and Jobs Act as well as clean energy investments and incentives included in the IRA.

Figure 3-2. Projected Short-Term Emissions Reductions Associated with the IRA



Source: Rhodium Group. The range reflects uncertainty around future fossil fuel prices, economic growth, and clean technology costs. It corresponds with high, central, and low emissions scenarios detailed in Taking Stock 2022 (<https://rhg.com/research/taking-stock-2022/>). Under the central scenario (not shown), the IRA accelerates emissions reductions to a 40% cut from 2005 levels.

3.3. HOW WOULD THE PROPOSED CONSTRUCTION, SURFACE DISTURBANCE, AND NOISE AFFECT MIGRATORY BIRDS, RAPTORS, AND THEIR HABITATS?

3.3.1 AFFECTED ENVIRONMENT

The analysis area for migratory birds is all lands within 1-mile of the project location because that encompasses the largest buffer applied to active raptor nests and because it represents a soil and vegetation habitat type used by avian species found in the project area.

Migratory Birds

The Utah Partners in Flight has prioritized migratory birds that are considered “most in need of conservation action, or at least need to be carefully monitored throughout their range within Utah.” These are also the species “that will be most positively influenced by management as well as those species with the greatest immediate threats” according to Utah Partners in Flight (Parrish, Howe, & Norvell, 2002).

High desert scrub and shrub-steppe migratory birds occupy much of the habitat within the 5,853,000 acres in the greater Uinta Basin area. Numerous species may migrate through or nest within the project area. The following migratory birds may inhabit the project area, including

those that are classified as High-Priority species (in bold) by Utah Partners in Flight (Parrish, Howe, & Norvell, 2002) and Utah BLM Sensitive species as defined in BLM Manual 6840 (marked by an *), according to the predominant habitat type found within the proposed project area:

- High Desert Scrub: Bewick's wren, black phoebe, black-chinned sparrow, black-throated sparrow, **Brewer's sparrow**, burrowing owl*, chukar, golden eagle*, gray flycatcher, green-tailed towhee, horned lark, lark bunting, lark sparrow, loggerhead shrike, mountain bluebird, **mountain plover***, northern harrier, northern mockingbird, prairie falcon, sage sparrow*, sage thrasher, Say's phoebe, vesper sparrow, and western meadowlark.
- Shrub-Steppe: **Brewer's sparrow**, chukar, **ferruginous hawk***, **greater sage-grouse***, mountain bluebird, **mountain plover***, **sage sparrow**, sage thrasher, vesper sparrow, and western meadowlark.

Raptors

Raptors occupy most of the 1.68 million acres within the Vernal Field Office. Some of the more prominent raptors that may utilize the project area and surrounding areas include, but are not limited to, the ferruginous hawk, golden eagle, prairie falcon, red-tailed hawk, Cooper's hawk, American kestrel, northern harrier, great horned owl, and other less common species may be present year-round or seasonally. Nesting tends to be concentrated around cliffs, large trees, embankments, and other habitat features. Raptor management for the BLM is guided by Appendix A in the 2008 RMP (BLM, 2008). These include seasonal timing limitations, seasonal buffers and controlled surface measures to protect raptor species (Romin & Muck, 2002).

The BLM has reviewed district files for raptor nesting and within all lands up to 0.25- to 1-mile of the project location. The district files identified one unknown nest within 0.5 miles of the project area. Biological surveys completed by West Water Engineering found an active great horned owl nest within 0.25 miles of the project area, an un-occupied golden eagle nest within 0.5 miles of the project, and an un-occupied red-tailed hawk nest within 0.5 miles of the project.

Past present and reasonably foreseeable actions in the analysis area include the oil and gas development described in Chapter 1, as well as recreational off highway vehicle use. There are no pending oil and gas permits within the analysis area. These activities would contribute noise, human activity, and surface disturbance which may disturb or displace birds and damage their habitats.

3.3.2 ALTERNATIVE A (NO ACTION) ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, there would not be any impacts to migratory birds including raptors.

3.3.3 ALTERNATIVE B (PROPOSED ACTION) ENVIRONMENTAL CONSEQUENCES

Potential effects of the Proposed Action Alternative on avian species include an initial loss or degradation of 28.6 acres of potential nesting and foraging habitats from construction activities, and disturbance to birds up to 1 mile from the proposed action from well drilling noise and human presence (including harassment, displacement, and noise). Those impacts could also cause nest or young abandonment. The proposed construction could fragment and manipulate the surrounding habitats and introduce or spread non-native invasive plant species. In general, such an environmental shift would probably have adverse impacts on wildlife species and would favor non-native and readily adaptive species.

Potential impacts to migratory birds within the proposed project area would also be dependent upon the time when project activities would occur. If these activities were to occur in the late fall, most of the species would have left the area during winter migration. If construction activities were to occur during the spring or summer months, it could cause birds to move into other adjacent habitats or into habitats where interspecific and intraspecific competition between species may increase. Surface and noise disturbance associated with project activities would be considered temporary. By following the mitigation measures outlined below these impacts would be minimized.

3.3.3.1 MITIGATION MEASURES

Migratory Birds

To protect migratory birds during the breeding season, USFWS Utah Field Office recommends a minimum timing restriction of April 1 to July 15 for ground-disturbing activities including habitat removal by clearing or cutting of vegetation (USFWS, 2020). If construction involving ground disturbing activities using heavy equipment is scheduled to start during the migratory bird nesting season between April 1 and July 15, a site-specific survey for migratory bird nests should be performed 7 to 10 days before project commencement to inventory any nesting activity. Any documented active nests sites would be avoided by a 100-foot buffer. The survey may be performed by a BLM biologist, or another biologist approved by the authorized officer.

Raptors

If construction were initiated during the nesting season between January 1 and September 31, a survey would be conducted within one mile of the project location prior to construction to identify raptor nests and their activity. The survey would be conducted by a BLM biologist or another biologist approved by the authorized officer. If active nests are discovered, all ground-disturbing activities would cease within the species-specific buffer specified by the 2008 Vernal Field Office RMP (0.25-1 mile). Work could resume with approval of the authorized officer once the biologist determined all young had fledged.

If construction is proposed within 0.25 mile of the great horned owl nest during the nesting season from February 1 to August 31, a survey would be conducted for portions of the project within 0.25 mile of the nest to identify activity. The survey would be conducted by a BLM biologist or another biologist approved by the authorized officer. If the known nest is determined

active, all ground-disturbing activities would cease within the 0.25 mile buffer. Work could resume with approval of the authorized officer once the biologist determined all young had fledged.

3.3.4 ALTERNATIVE C ENVIRONMENTAL CONSEQUENCES

Under Alternative C, the effects to migratory birds and raptors would be the same as those disclosed for the Proposed Action because the wells would still be drilled and the same surface disturbance would occur, and the same identified raptor nest and habitats would be present for the alternative location. The same mitigation measures that would apply to the proposed action (see Section 3.3.31) would apply equally to Alternative C.

3.3.5 CUMULATIVE IMPACTS

Past, present, and future uses and impacts of the impact area were described in Section 3.3.1. Cumulative impacts include loss of migratory bird breeding and foraging habitat, habitat fragmentation, and disruption or alteration of seasonal migration routes. Birds who avoid nesting within the immediate area of the project would have available habitat within the remaining intact cumulative impact area. Development of the action alternatives would likely contribute to a sustained reduction in the overall abundance of most affected species through direct and indirect impacts but would not be expected to increase cumulative effects to levels that would compromise the viability of any migratory bird population or the use of broader intact landscapes within or near the cumulative impact area. The No Action Alternative would not result in an accumulation of impacts.

3.4. HOW WOULD THE PROPOSED CONSTRUCTION AND SURFACE DISTURBANCE AFFECT BLM NATURAL AREAS?

3.4.1 AFFECTED ENVIRONMENT

The analysis area is the White River BLM Natural Area which is 6,720 acres. This area was selected because 17,628 feet of its eastern boundary is the west side of Asphalt Wash Road and 8,025 feet of right-of-way UTU-73643 (8% of its total length) proposed for amendment and the pipeline upgrade is in that Natural Area. Based on GIS review, the proposed pipeline upgrade would be partially within the Natural Area boundary and range within 30 feet outside its eastern edge. The proposed well pad and wells would be outside the Natural Area boundary. The 2008 Vernal RMP designated the White River Natural Area, and the right-of-way predates its establishment as it was authorized in 1964 (see Introduction in Chapter 1).

BLM Natural Areas are primitive and backcountry areas for which a land use plan decision has been made to manage them for their undeveloped character to provide opportunities for primitive recreational activities and experiences of solitude. These lands meet wilderness characteristics size criteria of 5,000 contiguous acres and provide naturalness, outstanding opportunities for either solitude or primitive unconfined recreation and may include supplemental values scientific, scenic, or historical values. The White River Natural Area unit was last inventoried for wilderness characteristics in June 2024. Of the 1.7 million acres of public land managed by the

Vernal Field Office approximately 106,178 acres are managed as BLM Natural Areas under the 2008 Vernal Field Office Resource Management Plan, as amended. Figure 3-3 shows the project in relation to nearby BLM Natural Areas and Lands with Wilderness Characteristics.

Past, present, and reasonably foreseeable actions in the analysis area include operation of the existing pipeline, and continued maintenance of the existing Southam Cyn 10-24-13-30 well pad. Both the current pipeline and the well pad were authorized prior to the designation on the White River Natural Area by the 2008 RMP. All surface disturbing activities from that well and pipeline have been completed and no additional impacts are expected from their continued operation or maintenance. Southam Cyn 10-24-13-30 well pad will eventually be plugged and reclaimed to match the surrounding topography although the timeline for such actions is unknown. There are no other past, present, or reasonably foreseeable actions in the analysis area. Other past, present, and reasonably foreseeable land uses include non-motorized recreation activities and grazing.

3.4.2 ALTERNATIVE A (NO ACTION) ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, there would be no direct or indirect effects to wilderness characteristics within the White River Natural Area.

3.4.3 ALTERNATIVE B (PROPOSED ACTION) ENVIRONMENTAL CONSEQUENCES

There would be no direct impacts from the proposed wells to the presence or absence of wilderness characteristics, or to the size or naturalness of the Natural Area because they are not within its boundaries. Because the proposed construction would be proximate to the White River Natural Area, its characteristics of solitude and primitive and unconfined recreation would potentially be indirectly affected by the sights and sounds of the oil and gas infrastructure operation and development.

Most disturbance to the vegetation from installation of the proposed surface pipeline upgrade would be minimized by using booms to place completed sections of surface pipeline into place from the existing road. However, 0.8 acres (<.001%) of the 6,720 Natural Area acres would be disturbed where 200 feet of the pipeline upgrade would be buried. This disturbance to vegetation and soils would adversely affect natural characteristics in those locations where the pipeline was buried but would be temporary and decrease over time as the areas were reclaimed (see Section 2.2.4) and vegetation given time to regrow. Additionally, the presence of people, vehicles, and equipment during construction would temporarily diminish opportunities for solitude. However, based on the wilderness inventory in June of 2024, the BLM determined that due to the topography and remoteness of the Natural Area, it would still be easy for a person to experience solitude within other areas of the unit not adjacent to the portions of its eastern edge where the pipeline upgrade was being installed, even while construction was underway.

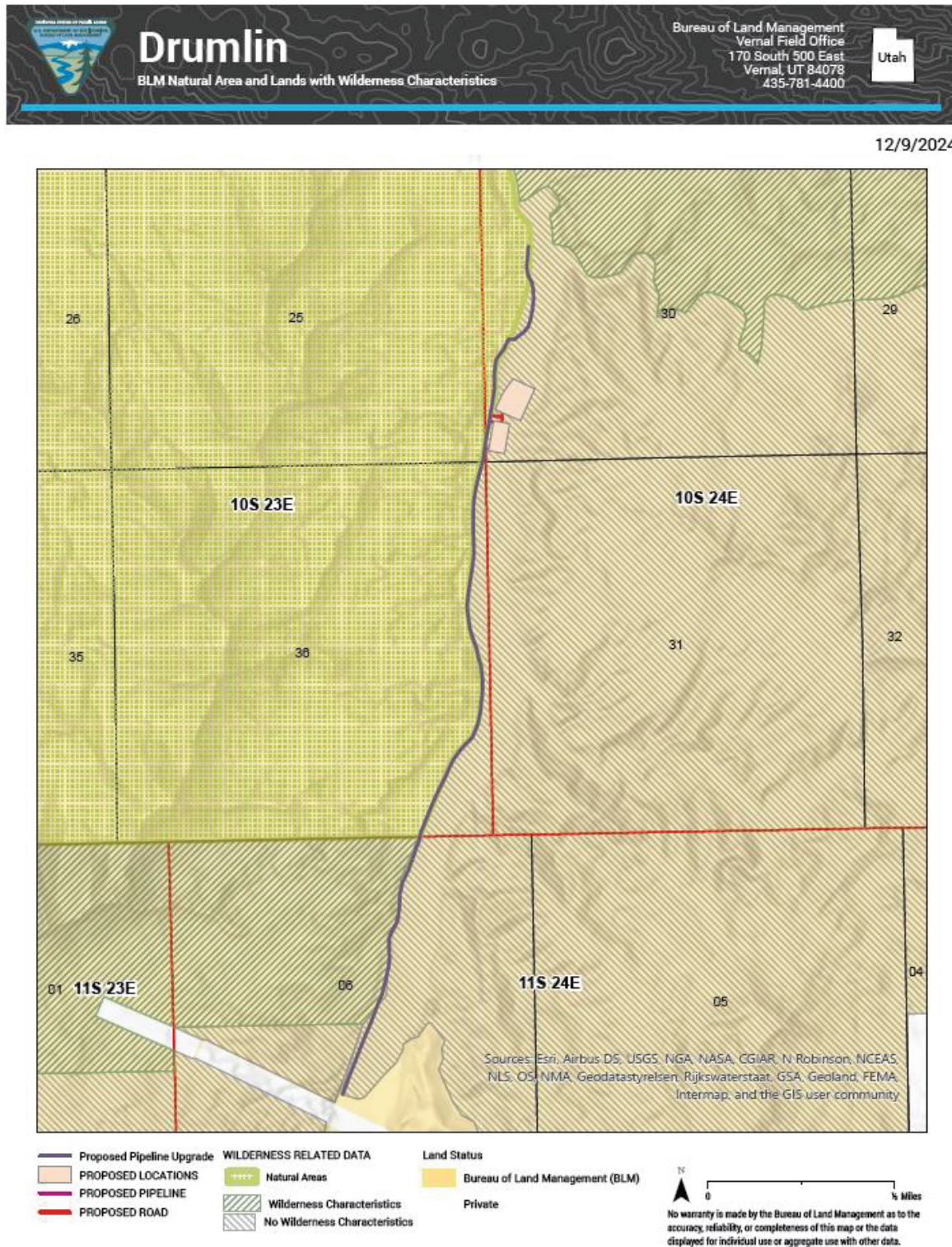


Figure 3-3. Map of nearby BLM Natural Areas and Lands with Wilderness Characteristics

Sound Readings were taken in the vicinity of the proposed action on November 22, 2024, and results of those readings can be viewed in Table 3-16. The meter used does not read decibels (dB) below 50, and all readings were taken using A-weighting which responds mainly to those noises falling within frequencies most sensitive to the human ear.

Table 3-16. Sound Meter Readings

Location of reading	Average sound in dB	Max sound in dB	Sound at 300ft in dB
Ambient noise at proposed well head location. 109.24447 W, 39.91486 N	Below 50 dB	Below 50 dB	Below 50 dB
At vehicle on Asphalt Wash Rd, with truck on and radio on high 109.26560 W, 39.91507 N	94 dB	112dB	Below 50 dB with a spike of 53dB
On the bank of the White River ¹ 109.28266 W, 39.94297 N	56 dB	60dB	Below 50 dB
Walking with no vegetation (dirt/ gravel) 109.28008 W, 39.94143 N	Below 50 DB	58DB	Below 50 Db
Walking through sparce vegetation 109.26499 W, 39.91499 N	53 dB	60dB	Below 50 dB
Walking through dense vegetation (sagebrush flat) 109.26594 W, 39.92788 N	54 dB	63dB	Below 50 dB
¹ Note: The route accessing the White River is not cherry stemmed out of the Natural Area and is not a route open to the public.			

Based on the results of the sound readings, combined with the applicant committed environmental protection measures in Section 2.2.6 that the proposed action “would not exceed seventy (70) decibels at a distance of 200 feet from the exhaust of any muffler” it can be assumed that the sound from the proposed action would not be at a level considered to be pervasive or omnipresent within the boundary of the natural area or LWC unit⁸. As the well pad and well heads are located outside of the boundaries of the White River Natural Area their associated sound would not be included in an analysis of impacts to the BLM Natural Area⁹.

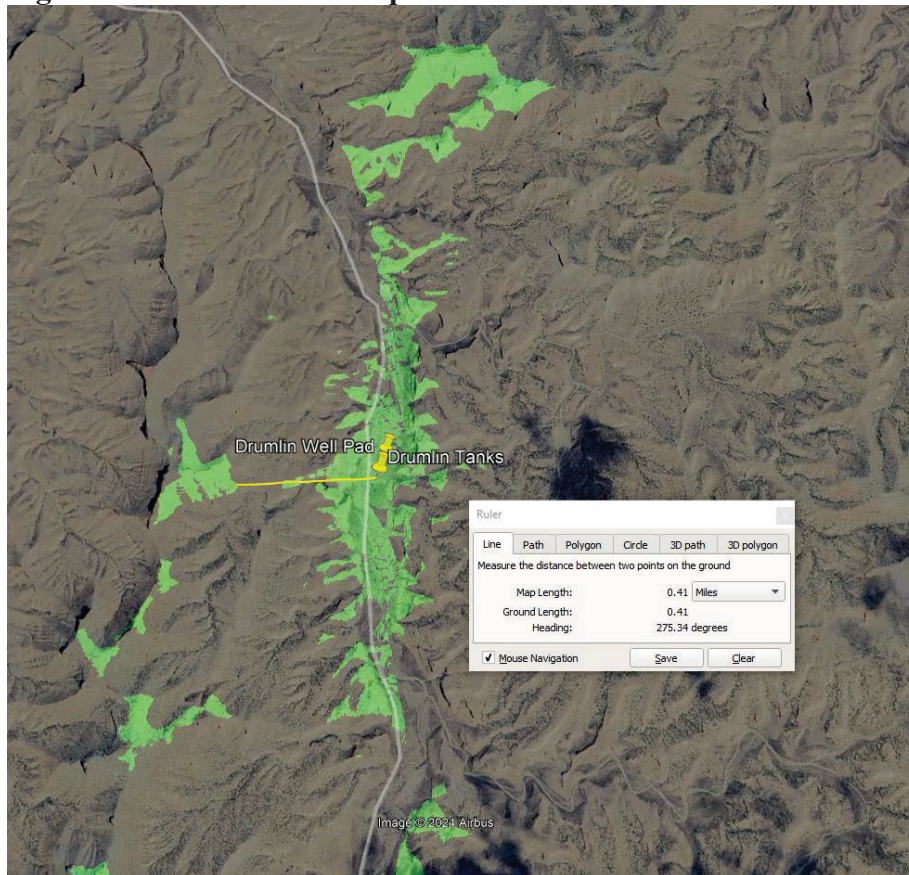
See Section 2.2.6 for applicant committed environmental protection measures for permanent facility visual mitigations. The proposed action includes a battery of 32 tanks, the tanks would not exceed 30 feet tall and are proposed to be in rows of eight. Each tank is approximately 14 feet wide, so each of the tank rows would be around 140 feet wide total. When a viewshed is ran using these dimensions the proposed action is shown as being visible ranging from 0.4 miles to 1.3 miles inside the White River Natural area (see Figure 3-4). At the nearest location that the

⁸ BLM Manual 6310 “Only consider the impacts of sights and sounds from outside the inventory area on the opportunity for solitude if these impacts are pervasive and omnipresent.”

⁹ BLM Manual 6310 “Human impacts outside the area will not normally be considered in assessing naturalness of an area”

project is determined to be visible (that is not connected to the road where visual impacts area already occurring) and assuming the entire height is unobscured by topography, the proposed action is likely to take up less than 1% of the casual observer's field of view. The percentage of field of view obscured would further diminish as those observers move farther away from the project location or as topography obscures portions of the location. Given that the well pad and/or facilities are outside of the boundary of the White River Natural Area, low in the landscape (not silhouetted against the skyline), are painted to blend in with the landscape, and given the single digit field of view percentage calculations, visual intrusions would not be at a level that they would be included in an analysis of impacts to the BLM Natural Area per BLM Manual 6310.

Figure 3-4. Viewshed of Proposed Action Tanks



3.4.4 ALTERNATIVE C ENVIRONMENTAL CONSEQUENCES

Under Alternative C there would be no potential direct effects to the White River Natural Area because all proposed infrastructure would be outside its boundary. However, the opportunities for solitude from increased traffic and noise from people, vehicles, and equipment would be temporarily reduced during construction at a similar level to Alternative B (see 3.4.3). Based on the wilderness inventory in June of 2024, the BLM determined that due to the topography and remoteness of the Natural Area, it would still be easy for a person to experience solitude within

others areas of the unit not adjacent to the portions of its eastern edge where the pipeline upgrade was being installed, even while construction was underway.

3.4.5 CUMULATIVE EFFECTS

Past, present, and reasonably foreseeable activities and their effects to the BLM Natural Area were listed in Section 3.4.1. Overall impacts to the White River Natural Area would not change when combined with the well pad and facilities under Alternatives A or C as they are proposed outside of the White River Natural Area boundary. Under the Proposed Action the proposed upgraded gas pipeline would replace and use the same corridor as the existing operational pipeline. Therefore, no changes in wilderness characteristics that would cause the area to no longer meet the minimum definitional criteria for wilderness characteristics are expected. No impacts would accumulate under the No Action or Alternative C from the pipeline upgrade.

3.5. HOW WOULD THE PROPOSED CONSTRUCTION AND SURFACE DISTURBANCE AFFECT LANDS WITH WILDERNESS CHARACTERISTICS?

3.5.1 AFFECTED ENVIRONMENT

The analysis area for lands with wilderness characteristics is the White River inventory unit which is 14,491 acres. This area was selected because the project location is near and partially within its eastern edge. The inventory unit consists of six subunits surrounding the White River BLM Natural Area. The White River lands with wilderness characteristics was last inventoried for wilderness characteristics in 2007.

The proposed pipeline upgrade would be in the southernmost subunit of the White River inventory unit boundary for half a mile. This subunit totals 571 acres and meets the definition for wilderness characteristics due to it being contiguous with the White River Natural Area which is managed for wilderness characteristics.

Past, present and reasonably foreseeable actions in the White River lands with wilderness characteristics include non-motorized recreation activities. There are no other past, present, or reasonably foreseeable actions in the analysis area.

3.5.2 ALTERNATIVE A (NO ACTION) ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative, there would be no direct or indirect effects to wilderness characteristics within the White River lands with wilderness characteristics inventory unit.

3.5.3 ALTERNATIVE B (PROPOSED ACTION) ENVIRONMENTAL CONSEQUENCES

The proposed well pad would not directly impact the wilderness characteristics, size, or naturalness of the analysis area because it would be outside the White River inventory unit boundaries. However, due to proximity to the White River inventory unit, opportunities for solitude and primitive and unconfined recreation would potentially be indirectly affected by the sights and sounds of the oil and gas infrastructure operation and development.

Construction of the proposed pipeline upgrade could cause loss of wilderness characteristics to portions of the southernmost subunit of the analysis area. While constructing the pipeline in the roadway and booming it into place (see Section 2.2.2) would reduce the intensity of effects to the wilderness characteristics, some impacts are still likely to occur. These impacts would include a decrease in the apparent naturalness since the visibility of the proposed pipeline upgrade would exceed the visibility of the existing pipeline due to its increased size. Additionally, the presence of people and noise from vehicles and equipment would temporarily diminish opportunities for solitude within the southernmost subunit of the White River inventory unit while construction is underway. Sound and visual impacts would be similar in nature to those of BLM Natural Areas (see Section 3.4.3).

3.5.4 ALTERNATIVE C ENVIRONMENTAL CONSEQUENCES

Under Alternative C, the impacts to wilderness characteristics would be the same as the impacts under Alternative B because the proposed pipeline upgrade would still be within the boundary of the southernmost subunit of the White River wilderness characteristics inventory unit. Sound and visual impacts would be similar in nature to those of BLM Natural areas (see Section 3.4.3).

3.5.5 CUMULATIVE IMPACTS

Past, present, and reasonably foreseeable activities and their effects to the White River wilderness characteristics inventory unit were listed in Section 3.4.1. Overall impacts to the would not change when combined with the Proposed Action or Alternative C as the well pad and facilities proposed are outside of the unit boundary and the upgraded gas pipeline would replace and use the same corridor as the existing operational pipeline. Therefore, no changes in wilderness characteristics that would cause the area to no longer meet the minimum definitional criteria for wilderness characteristics are expected. No impacts would accumulate under the No Action.

3.6. HOW WOULD THE PROPOSED SURFACE DISTURBANCE AND INFRASTRUCTURE AFFECT VISUAL RESOURCES?

3.6.1 AFFECTED ENVIRONMENT

The affected environment for visual resources is a 1-mile buffer around the project location. This area was selected and is appropriate to analyze visual effects because topography in the area makes it unlikely that effects to visual resources could extend beyond that distance.

The analysis area includes locations of Visual Resource Management classes II and IV. Class II areas allow for low changes to be made to the landscape which should not attract the attention of the casual observer. Class IV areas allow for major modifications to the landscape, although every effort should be made to carefully locate facilities to minimize their impact to the surrounding visual landscape. VRM class IV objectives in a non-sensitive area can be met by using appropriate paint colors/finishes for facilities and locating resources away from the primary line of sight along primary travel routes. For example, placing a facility further off the road and in receded position or a position screened from the primary travel arteries by natural

slopes or terrain features minimizes its impact to visual resources. See Section 2.2.6 for applicant committed environmental protection measures for permanent facility visual mitigations. Approximately 0.8 mile of the proposed pipeline upgrade would be in Visual Resource Management Class II. The rest of the project would be in Class IV.

The viewshed in the project area is a landscape-based high desert, mainly consisting of natural browns and reds, rock outcrops, horizontal and vertical broken lines with sparse, low-lying vegetation. Existing structures include abandoned well pads in various states of reclamation, existing drilling structures, and surface pipelines running along the ground with associated movement forms, lines, textures, and colors.

Past present and reasonably foreseeable actions in the analysis area include the oil and gas development described in Chapter 1, as well as recreational off highway vehicle use. Recreational off highway vehicle use is primarily confined to existing routes although it does present a possibility of route proliferation which could have an adverse impact on the visual landscape. There are no pending oil and gas permits within the analysis area. It is not expected that either of these activities would exceed the allowed visual contrast based on current management objectives.

3.6.2 ALTERNATIVE A (NO ACTION) ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative there would be no direct or indirect effects to visual resources.

3.6.3 ALTERNATIVE B (PROPOSED ACTION) ENVIRONMENTAL CONSEQUENCES

All construction and facilities in Visual Resource Management Class IV locations would be within the allowed management objectives, though the identified mitigation measure would minimize potential impacts to dark skies (see Section 3.6.3.1).

The visibility of the proposed pipeline upgrade would exceed the visibility of the existing pipeline due to its increased size. Construction of the pipeline in the roadway and booming it to the surface would minimize effects from surface disturbance to visual resources. However, there are several areas where the pipeline upgrade would be buried at road or water feature crossings; these areas would total less than one acre of disturbance within the Class II areas. The visual impact caused by loss of vegetation in areas where the pipeline was buried would be temporary and decrease over time as the areas were reclaimed (see Section 2.2.4) and vegetation given time to regrow.

3.6.3.1 MITIGATION MEASURES

- All lighting on facilities would be Dark Sky-friendly to protect the night sky viewshed, unless superseded by safety needs.

3.6.4 ALTERNATIVE C ENVIRONMENTAL CONSEQUENCES

Under Alternative C, the pipeline upgrade would be entirely within Visual Resource Management Class IV locations. This management class allows for major modification of the landscape, so all the construction and infrastructure would be within the allowed management

objectives, though the identified mitigation measure would minimize potential impacts to dark skies (see Section 3.6.3.1).

3.6.5 CUMULATIVE IMPACTS

Past, present, and reasonably foreseeable activities and their effects to the White River wilderness characteristics inventory unit were listed in Section 3.4.1. Both action alternatives would be expected to affect visual resources as described in Sections 3.6.3 and 3.6.4. However, the cumulative level of effects after the incremental contribution of the proposed development would be unlikely to result in a change visual character that would cause the area to no longer meet the class definition. The No Action Alternative would not result in an accumulation of impacts.

3.7. HOW WOULD WATER DEPLETIONS FROM THE WHITE RIVER FOR THE PROPOSED DRILLING, COMPLETIONS, AND DUST CONTROL AFFECT THREATENED AND ENDANGERED FISH AND THEIR HABITATS?

3.7.1 AFFECTED ENVIRONMENT

Through review of data from the U.S. Fish and Wildlife Service's (USFWS) website Information for Planning and Consulting (IPaC), which identifies habitat significant to listed species (USFWS 2024), the BLM determined the project location is outside any designated critical or occupied habitat for Colorado pikeminnow (*Ptychocheilus lucius*) [Endangered], razorback sucker (*Xyrauchen texanus*) [Endangered], bonytail chub (*Gila elegans*) [Endangered], and humpback chub (*Gila cypha*) [Threatened], referred to as the Colorado River fish. Therefore, the analysis area, or Area of Impact (AOI), is the portions of the Green River Watershed downstream of Asphalt Wash and the portions of the White River from which water would be depleted to Lake Powell.

The project location is in the 100-year floodplain of Asphalt Wash which runs to the White River. Additionally, portions of the proposed well pad would overlap the intermittent wash that drains runoff surface water from rain and snow into the White River.

Water depletions have been one of the leading negative impacts to the decreased success of native fish in the Upper Colorado River System (Pennock et al. 2022). To address depletion and other impacts on the Colorado River fish and their critical habitats, a Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) was initiated on January 22, 1988. Under the 1988 Recovery Program, any water depletions from tributary waters within the Colorado River drainage are considered to “jeopardize the continued existence” of these fish. To further define and clarify the recovery processes in the Recovery Program, an Endangered Species Act Section 7 Agreement was implemented on October 15, 1993, by Recovery Program participants. Incorporated into this agreement is a Recovery Implementation Program Recovery Action Plan (RIPRAP). The RIPRAP identifies actions currently required to recover the endangered fish species in the most expeditious manner. Included in the RIPRAP was the requirement that a one-time depletion fee would be paid to help support the Recovery Program for all non-historic water depletions (i.e., occurring after January 1988) from the Upper Colorado River Basin. The depletion fees (\$25.78 per acre-foot as of July

20, 2023) were intended to be the reasonable and prudent alternative to avoid jeopardy to the endangered fishes by depletions to the Upper Colorado River Basin (USFWS 2007c). In 1995, the USFWS eliminated the water depletion fees for non-historical water depletions (permitted after January 1988) from the Upper Colorado River Basin of 100 acre-feet or less (USFWS 1995).

Larval fish are very small (<0.5 inches total length) and incapable of directed swimming from the time of hatching through the first 2-4 weeks of their life. Therefore, they are susceptible to entrainment (being taken into a waterline) at points of diversion where water is being depleted. Depending on the water year, larval fish of Threatened and Endangered species may be present in the White River from as early as April 1 to as late as August 31 (earlier in dry years; later in wet years). Larval drift studies indicate their period of greatest daily activity is during the midnight hours (from 10pm to 2am). Larval drift abundance is lowest during dusk and the afternoon.

The following subsections describe the status of the species and critical habitat.

Colorado Pikeminnow (*Ptychocheilus lucius*)

The Colorado pikeminnow is the largest cyprinid fish (minnow family) native to North America and evolved as the main predator in the Colorado River system. These fish begin consuming other fish for food at an early age and seldom eat anything else (Sigler and Sigler 1996). The species is endemic to the Colorado River Basin, where it was once widespread and abundant in warm-water rivers and tributaries from Wyoming, Utah, New Mexico, and Colorado downstream to Arizona, Nevada, and California (USFWS 2002b). Currently, wild populations of pikeminnow occur only in the Upper Colorado River Basin and the species occupies only 25 percent of its historic range-wide habitat (USFWS 2002b). Colorado pikeminnow are long distance migrators, moving hundreds of miles to and from spawning areas, requiring long sections of river with unobstructed passage (USFWS 2010). They are adapted to desert river hydrology characterized by large spring peaks of snow-melt runoff and low, and stable base flows (USFWS 2010). A final recovery plan was completed in 2023 for the Colorado pikeminnow (USFWS 2023).

The USFWS designated six reaches of the Colorado River System as critical habitat for the Colorado pikeminnow on March 21, 1994 (59 FR 13374). Designated critical habitat makes up about 29 percent of the species' historic range and occurs exclusively in the Upper Colorado River Basin. Portions of the Colorado, Green, Yampa, White, and San Juan Rivers are designated critical habitat (USFWS 2010). The primary constituent elements of the critical habitat include water, physical habitat, and the biological environment (59 FR 13374). Water includes the quantity and quality of water delivered to critical habitat in accordance with the hydro logic regime requirements for the species. The physical habitat includes areas of the Colorado River system that are inhabited or potentially habitable for use in spawning and feeding, as a nursery, or serve as corridors between these areas. This includes oxbows, backwaters, and other areas in the 100-year floodplain that provide access to spawning, nursery, feeding, and rearing habitats when flooded. The biological environment includes food supply, predation, and competition from other species.

Razorback Sucker (*Xyrauchen texanus*)

The largest native sucker to the western United States, the razorback sucker is endemic to the Colorado River Basin (Sigler and Sigler 1996; USFWS 2002d). The species feeds primarily on algae, aquatic insects, and other available aquatic macroinvertebrates using their ventral mouths and fleshy lips (Sigler and Sigler 1996). Historically, the razorback sucker occupied the mainstem Colorado River and many of its tributaries from northern Mexico through Arizona and Utah into Wyoming, Colorado, and New Mexico (USFWS 2002d). In the late 19th and early 20th centuries, it was abundant in the Lower Colorado River Basin and common in parts of the Upper Colorado River Basin, with numbers apparently declining upstream (USFWS 2002d). Distribution and abundance of razorback sucker declined throughout the 20th century across its historic range, and the species now exists naturally only in a few small, unconnected populations or as dispersed individuals (USFWS 2010). Razorback suckers are currently found in small numbers in the Green River, upper Colorado River, and San Juan River sub-basins (USFWS 2002d).

There are 15 reaches of the Colorado River system designated as critical habitat for the razorback sucker on March 21, 1994 (59 FR 13374). The closest of which is approximately 12 direct miles downstream from the project. Designated critical habitat makes up about 49 percent of the species' original range and occurs in both the Upper and Lower Colorado River Basins (USFWS 2010). In the Upper Basin, critical habitat is designated for portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan Rivers. Portions of the Colorado, Gila, Salt, and Verde Rivers are designated in the Lower Basin (USFWS 2010). The primary constituent elements are the same as those described for Colorado pikeminnow.

Humpback Chub (*Gila cypha*)

The humpback chub is a medium-sized freshwater fish of the minnow family endemic to the Colorado River basin. It uses its large fins to "glide" through slow-moving areas, feeding on insects (USFWS 2010). Historic distribution reports indicate that the species inhabited canyons of the Colorado River and four of its tributaries: The Green, Yampa, White, and Little Colorado Rivers (USFWS 2010). Presently the species occupies about 68 percent of its historic habitat (USFWS 2002c).

Currently, five wild populations occur upstream of Glen Canyon Dam and two downstream (USFWS 2002c). In the Upper Colorado River Basin, the two most stable populations are found near the Colorado/Utah border: one at Westwater Canyon in Utah and one at Black Rocks, in Colorado (Upper Colorado River Endangered Fish Recovery Program and San Juan River Basin Recovery Implementation Program 2010). Smaller numbers in the Upper Basin were found in the Yampa and Green Rivers in Dinosaur National Monument, Desolation and Gray Canyons on the Green River in Utah, and Cataract Canyon on the Colorado River in Utah (USFWS 2002c). The two populations in the Lower Colorado River Basin occur in the mainstem Colorado and Little Colorado Rivers (USFWS 2010). The Little Colorado River population, found in the Grand Canyon, is the largest known population, sheltering up to 10,000 fish (USFWS 2002c and USFWS 2010). Recently the humpback chub was downlisted from Endangered to Threatened in 2021 (USFWS 2021).

USFWS designated seven reaches of the Colorado River System as critical habitat for the humpback chub on March 21, 1994 (59 FR 13374). The closest of which is approximately 36 miles downstream from the project. Designated critical habitat makes up about 28 percent of the species' original range and occurs in both the Upper and Lower Colorado River Basins. In the Upper Colorado River Basin, critical habitat includes portions of the Yampa, Green, and Colorado Rivers, primarily including canyon habitats, such as Yampa, Desolation and Gray, Westwater, and Cataract Canyons. Although humpback chub life history and habitat use differ from the other endangered Colorado River fish, the primary constituent elements (water, physical habitat, and biological environment) of their critical habitat are the same as those described for Colorado pikeminnow.

Bonytail (*Gila elegans*)

The bonytail is a medium-sized freshwater fish in the minnow family, endemic to the Colorado River Basin. Little is known about the specific food and habitat of the bonytail because the species was extirpated from most of its historic range prior to extensive fishery surveys, but it is considered adapted to mainstem rivers, residing in pools and eddies, while eating terrestrial and aquatic insects (USFWS 2002a and USFWS 2010). Bonytail were once widespread in the large rivers of the Colorado River Basin (USFWS 2002a).

The species experienced a dramatic decline starting in about 1950, following construction of mainstem dams, introduction of nonnative fishes, poor land-use practices, and degraded water quality (USFWS 2002a). Population trajectory over the past century and reasons for decline are unclear due to the lack of accurate distribution and abundance records (USFWS 2010).

Bonytail are now rarely found in the Green and Upper Colorado River sub-basins and are the rarest of all the endangered fish species in the Colorado River Basin (USFWS 2010). No wild, self-sustaining populations are known to exist upstream of Lake Powell and in the recent past only a handful of bonytail were captured on the Yampa River in Dinosaur National Monument, on the Green River at Desolation and Gray canyons, and on the Colorado River at the Colorado/Utah border and in Cataract Canyon (USFWS 2010).

USFWS designated seven reaches of the Colorado River as critical habitat for the bonytail on March 21, 1994 (59 FR 13374). The closest of which is approximately 36 miles downstream from the project. Portions of the Green, Yampa, and Colorado Rivers are designated as critical habitat, representing about 14 percent of the species' historic range (USFWS 2010). The primary constituent elements are the same as those described for Colorado pikeminnow.

Past, present, and reasonably foreseeable actions in the analysis area that may affect fish or their critical habitats include infrastructure development; construction and operation of dams along major waterways; water retention, diversion, or dewatering of springs, wetlands, or streams; water depletions for agriculture, aquaculture, municipal, and mining uses including oil and gas development; recreation, including off-road vehicle activity; and expansion of agricultural or grazing activities, including alteration or clearing of native habitats for domestic animals or crops.

3.7.2 ALTERNATIVE A (NO ACTION) ENVIRONMENTAL CONSEQUENCES

Under the No Action Alternative there would be no impacts to Colorado River fish because no water depletion from the White River would occur.

3.7.3 ALTERNATIVE B (PROPOSED ACTION) ENVIRONMENTAL CONSEQUENCES

The project **may affect, or likely to adversely affect** the Colorado River fish and their critical habitats. The proposed action would use 528 acre-feet of water from the White River system for drilling, equipment testing (e.g., hydrostatic testing of pipelines), and for dust abatement. The water rights 49-2398, #49-2445, and #49-2449 proposed to be used have not or were not proofed prior the 1988 programmatic review, so were not included in the programmatic Section 7 consultation for water depletions' impacts to Colorado River fish described in Section 3.7.1. Depletion from the proposed water rights would be classified as "new" depletions and have potential to affect the four Colorado River fish.

Water depletions reduce the ability of the river to undergo geomorphic changes that create and maintain elements that define critical habitat. Water depletions contribute to the reduction of instream complexity and floodplain connectivity, which are both key elements in sustainability of Colorado River fish in the White River. Critical habitats include but are not limited to creation of gravel bars, eddies, backwater habitats from flooding or creation of oxbows, riffles, and pools. Flows reduction decreases the ability for the river to inundate large wood structures like fallen trees and create complex instream habitat from wood additions. Water depletions can create effects of reduced flow magnitude, habitat alterations and degradations, and increased fragmentation (Pennock et al. 2022). The 528 ac/ft water depletion for the project would contribute to the decline of important habitat needed for the four Colorado River fish. Food supply, predation, and competition are elements of the biological environment that can be altered by changes in habitat and flow availability. Food supply is a function of nutrient supply and productivity, which could be limited by the reduction of flows through water depletions. The 528 ac/ft of water deletion from the project would be a contributing factor reducing movement of sediment and nutrients through the system that would be needed for food production for invertebrates and ultimately the four Colorado River fish. Predation and competition from nonnative fish species are additional contributing factors in the decline of the four Colorado River fish. The water depletion of 528 ac/ft would contribute to alterations in flow regimes that favor nonnative fishes and potentially increasing the presence and predation rate from nonnative fish species.

The proposed surface disturbance for the well pad and associated infrastructure would not impact Colorado River fish because no habitat is present in those acres and Asphalt Wash Road is already disturbed. However, construction of the proposed pipeline upgrade within a wash that leads to the White River could adversely affect downstream fish habitats if leaks or spills occurred. Drilling of the proposed wells could degrade habitat for the Colorado River fish in the White River by increasing erosion, sediment yield, and the potential for exposure to hazardous substances in the case of an accidental spill or leaks. The water disposal methods (see Section 2.2.3) would minimize onsite risk of holding materials and potential contamination of the White River. The designed reclamation and erosion control measures (see Section 2.2.4) and containment of drilling fluids including salts and chemicals in the closed-loop system (see

Section 2.2) would minimize erosion from the proposed surface disturbance and should reduce sedimentation and contamination to the White River.

The proposed surface water depletion from the White River through direct pumping into truck or the lay flat waterline in critical habitat for Colorado Pikeminnow and Razorback sucker could entrain larval endangered fish from the White River. As there is no determined time when water pumping would occur, there is potential for entrainment of larval fish during certain times of the year if pumping were to occur.

These adverse effects could be minimized by implementing the mitigation measures in Section 3.7.3.1.

3.7.3.1 MITIGATION

- The operator would pay the recovery program depletion fee to the USFWS.
- The operator would avoid entrainment of larval fish as follows:
 1. The best method to avoid entrainment is to pump an off-channel location – one that does not connect to the river during high spring flows. An infiltration gallery constructed in a Service approved location is best.
 2. If the pump head were located in the river channel the following stipulations would apply:
 - a. Do not situate the pump in a low-flow or no no-flow area as these habitats tend to concentrate larval fishes.
 - b. Limit the amount of pumping, to the greatest extent possible, from April 1 to August 31 when larval fish are most likely to be present (see above)
 - c. Do not pump from 10pm to 2am.
 3. Screen all pump intakes with 3/32-inch mesh material.
 4. Approach velocities for intake structures should follow the national marine Fisheries Service's document "Fish Screen Criteria for Anadromous Salmonids". For all instream intakes, the approach velocity should not exceed 0.33 foot per second (ft/s).
 5. Report any fish impinged on the intake screen or entrained into irrigation canals to the Service (801.975.330) or the Utah Division of Wildlife Resources.

3.7.4 ALTERNATIVE C ENVIRONMENTAL CONSEQUENCES

Under Alternative C, all the effects would be the same as those disclosed for the Proposed Action because the wells would still be drilled, and the same water would be depleted. These adverse effects could be minimized by implementing the identified mitigation measures (see Section 3.7.3.1).

3.7.5 CUMULATIVE IMPACTS

Cumulative actions in the analysis area were described in Section 3.7.1. Cumulative impacts include the decline in abundance or range of the Colorado River fish, declines in quality of their habitats, and loss of individuals due to water depletion. The quantity of water that flows into the analysis area was calculated using the USGS White River Stream Gauge near Watson, UT, which is above the point of diversion for the proposed action. In the last five years the average

volume of water flowing into the analysis area is 387,884 ac/ft per year. The 2015 U.S. Geological Survey (USGS) report, Estimated Use of Water in the United States in 2015 (Dieter et al. 2018), estimates total surface and ground water use for 2015 in Daggett, Duchesne, and Uintah Counties is 645,688 acre-feet per year (ac/ft per year), which includes the Green River, Yampa River, and White River (see AIB-1). Less than 1% (0.83%, 5,342 ac/ft per year) of total water use in the Uinta Basin is attributable to mining, the category which oil and gas operations are reported. The proposed action would utilize up to 528 ac/ft of water only attributing to ~10% of water used for mining operation in Uinta Basin and would result in <0.002% of the annual water flowing into the analysis area on the White River. For the Colorado River fish, these effects are being reduced through the Upper Colorado River Endangered Fish Recovery Program. The No Action Alternative would not result in an accumulation of impacts. The Proposed Action and Alternative C would both result in 528 acre feet of depletion.

4.0 CONSULTATION AND COORDINATION

4.1 PERSONS, GROUPS, AND AGENCIES CONSULTED

Table 4-1 lists the persons, groups, and agencies that were coordinated with or consulted during the preparation of this project. The table also summarizes the conclusions of those processes.

Table 4-1. Coordination and Consultation

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Tribal Historic Preservation Office of the Uintah and Ouray Reservation	Section 106 of the National Historic Preservation Act	Based on the results of the pedestrian survey and records search summarized in U24A10039, the BLM has made a determination of “No Historic Properties Affected”. These archaeological reports cover 100% of the project area. These determinations, and project documentation, were submitted digitally to the Ute THPO on 4/4/2024. No objection was received within 30 days of the documented findings and the BLM has fulfilled its responsibilities under Section 106, pursuant to 36CFR800.3(c)(4).
Native American Nations and Tribal Organizations	Executive Order 13175, Executive Order 13007	Pursuant to the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 131) 13 Native American Tribes were notified of the project by letter mailed April 15, 2024. The BLM did not receive any responses from tribes that were notified. There are no identified Native American concerns within the project area.
U.S. Fish and Wildlife Service	Water Depletion	A Biological Opinion from the US Fish and Wildlife Service was provided on 10/02/2024 with their concurrence on effects to listed fish and their habitats.

4.2 SUMMARY OF PUBLIC PARTICIPATION

The APDs were posted for 30 days at: <https://reports.blm.gov/report/AFMSS/34/30-Day-Federal-Public-Posting/> website in accordance with 43 CFR 3162.3-1(g). The public was also notified of this project April 10, 2024, by posting it online to the BLM’s public-access National Environmental Policy Act Register. An email from the Southern Utah Wilderness Alliance (SUWA) was received on April 9, 2024, requesting the BLM to hold a 30-day public comment

period on the Environmental Assessment and to analyze and disclose the effects of the proposed action on the White River and White River Lands with Wilderness Characteristics and BLM Natural Area. An email from Rig to Flip was received on April 22, 2024, requesting to see documents regarding the proposed action. A second email was received from SUWA on May 29, 2024, which had an attached letter mentioning this project's NEPA number and stating the BLM should disclose the proposed water use and analyze environmental impacts of water use including cumulative impacts.

The BLM held a public comment period from July 19, 2024 to August 19, 2024. Six letters were received. The BLM's extractions of the substantive comments, and the responses to those comments, are in Appendix D.

4.3 LIST OF PREPARERS

The specialists listed in the following table(s) assisted in the preparation of this Environmental Assessment.

Table 4-2. BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
David Gordon	Natural Resource Specialist	Project Lead, Chapters 1, 2, 4, and 5
Tyler Elgiar	Air Quality Specialist	Ambient Air Quality (3.1) and Greenhouse Gases and Climate Change (3.2)
Cambree Carroll	Wildlife Biologist	Migratory Birds and Raptors (3.3)
Jessica Farmer	Outdoor Recreation Planner	BLM Natural Areas (3.4), Lands with Wilderness Characteristics (3.5), and Visual Resources (3.6)
Tyler Arnold	Fish Biologist	Threatened and Endangered Fish (3.7)
Joel Ward	Planning and Environmental Specialist	Quality Assurance and Public Participation
Stephanie Howard	Branch Chief	Quality Assurance and Public Participation

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APPENDICES

APPENDIX A. INTERDISCIPLINARY TEAM CHECKLIST

Interdisciplinary Team Checklist

Resources and Issues Considered (Includes Supplemental Authorities Appendix 1 H-1790-1)

Project Title: Anschutz Proposes the Drumlin Pad

NEPA Log Number: DOI-BLM-UT-G010-2024-0064-EA

Project Leader: David Gordon

Determination of Staff*: *(Choose one of the following abbreviated options for the left column)*

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Table Appendix A-1. Interdisciplinary Team Checklist

*	Resource/Issue	Rationale	Signature	Date
PI	Air Quality	<p>The Proposed Action would result in criteria and hazardous air pollutant emissions. Emissions would occur from vehicle transportation to and from the site, heavy construction equipment, well drilling, and well operation. A detailed analysis has been completed for this resource.</p> <p>The project is located in the Uinta Basin Ozone (O₃) Nonattainment Area (Marginal). 40 CFR 93.153 defines the de minimus thresholds for nitrogen oxides (NO_x) and volatile organic compounds (VOC) in a marginal O₃ nonattainment area as 100 tons per year. For general conformity purposes, only emissions from the maximum annual development scenario (four wells annually during phase two of development) were analyzed (Section 3.1.3.1). Maximum potential emissions from this project over an annual basis are estimated to be below de minimis levels. The emissions inventory for the project total 95.48 tons of NO_x and 12.79 tons of VOCs per year. A general conformity determination is filed in the project record.</p>	Tyler Elgiar	07/02/24

*	Resource/Issue	Rationale	Signature	Date
PI	Greenhouse Gas Emissions	<p>The Proposed Action would result in greenhouse gas (GHG) emissions. Emissions would occur from vehicle transportation to and from the site, heavy construction equipment, well drilling, and well operation. A detailed analysis has been completed for this resource.</p> <p>Maximum potential direct and indirect GHG emissions associated with the Proposed Action, calculated as CO₂e, would be 0.88 megatonnes per year.</p>	Tyler Elgiar	07/02/24
PI	BLM Natural Areas	Per GIS and RMP review the proposed pipeline upgrade in the right-of-way proposed for amendment would be partly within the White River BLM Natural Area.	Jessica Farmer	05/29/24
NP	Cultural: Archaeological Resources	One Class III intensive pedestrian survey of the Area of Potential Effect (APE) for the proposed action was conducted under project U24A10039. A determination was made of “No Historic Properties Affected” for this project. This determination, and project documentation, was submitted digitally to the Ute THPO on 4/4/2024. No objection was received within 30 days of the documented finding and the BLM has fulfilled its responsibilities under Section 106, pursuant to 36CFR800.3(c)(4).	Salazar/Reitze	06/04/24
NP	Cultural: Native American Religious Concerns	Pursuant to the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 131) 13 Native American Tribes were notified of this project by letter sent April 15, 2024. No tribes that were contacted responded with concerns.	Salazar/Reitze	06/04/24
NP	John Wesley Powell NCA & McCoy Flats Mountain Biking Area	Per GIS review the well pad and pipeline upgrade are outside the proposed boundaries of the John Wesley Powell NCA and the McCoy Flats Mountain Biking area, therefore no detailed analysis is required.	Jessica Farmer	05/29/24
NP	Designated Areas: Areas of Critical Environmental Concern	Per GIS and RMP review no areas of critical environmental concern are present in the well pad or pipeline upgrade area, therefore no detailed analysis is required.	Jessica Farmer	05/29/24
NP	Designated Areas: Wild and Scenic Rivers	Per GIS and RMP review, the well pad and pipeline upgrade would be 1.5 miles from the White River which is eligible as wild but has not been designated suitable and as such is not managed specifically for those characteristics. Additionally, there is topographic cover that would prevent adverse impacts to the eligibility of the river corridor caused by the construction of this project. The nearest segment of suitable wild and scenic is the Lower Green River which is 26 miles away from the	Jessica Farmer	05/29/24

*	Resource/Issue	Rationale	Signature	Date
		proposed action. This distance separates the proposed action from the river corridor, so no detailed analysis is required.		
NP	Designated Areas: Wilderness Study Areas	Per GIS and RMP review no wilderness study areas are present in the well pad and pipeline upgrade area, therefore no detailed analysis is required.	Jessica Farmer	05/29/24
NI	Environmental Justice	The project location is within US Census Block Group 490479682011, which is the analysis area for the Drumlin well pad and pipeline upgrade, because the project location is in that block group. According to the EPA's Environmental Justice Screening and Mapping Tool (https://ejscreen.epa.gov/mapper/), the block group has a population of 324 and is 2,626 square miles. The community information for this block group states that 46% of the population is low income. There are 49% people of color populations within the block group and 51% of the population is white. To determine if the proposed action impacts would cause a disproportionate and adverse impact to these communities, the BLM specialists conducted an aggregate analysis of resources including species, habitat, areas of critical environmental concern, prime farmland, water quality and quantity, cultural resources, recreation access, transportation, and tribal sacred sites impacts as described in other sections of this checklist. The BLM determined that construction and operation of the proposed well pad and associated infrastructure would not have disproportionate and adverse impacts on environmental justice populations.	David Gordon	06/24/24
NP	Farmlands (prime/unique)	Per review of USDA Natural Resource Conservation Service's Web Soil Survey website. There are no prime and/or unique farmlands within the project area. Therefore, no detailed analysis is required.	David Gordon	06/17/24
NI	Fuels/Fire Management	Construction of the proposed well pad and pipeline upgrade would have no measurable impact to fire. No future fuels management activities are planned for the project area. Surface-disturbing activities may impact Fire Management due to the increased potential of promoting invasive species, primarily <i>Bromus tectorum</i> (cheatgrass), which could increase fire frequency in those areas. Applying the designed weed control (see Section 2.2.5) in accordance with the Green River District Reclamation Guidelines to any surface-disturbed areas should help prevent the buildup of the additional hazardous fuels.	Chris Perkins	05/28/24
NI	Geology / Minerals / Energy Production	The construction of a well pad will not directly impact Hydrocarbons. After construction,	Dallas Nutt	06/18/24

*	Resource/Issue	Rationale	Signature	Date
		Hydrocarbon extraction will potentially deplete reserves which is allowed by the current RMP. No economic solid minerals will be affected as there are none in the project area. This information is per ArcMap Data layers.		
NI	Lands/Access	<p>A review of MLRS and the Master Title Plats show that there are authorized rights-of-way within ½ mile of the proposed well pad and associated infrastructure. Notice letters were sent to the right-of-way holders on April 19, 2024, with one response received back from Uintah County requesting that all tie-ins or crossings with County claimed roads be buried and not block access. In addition, they requested the applicant establish a road maintenance agreement with the County prior to implementing any work or upgrades to County roads.</p> <p>Traffic on the existing access roads may increase during the proposed construction, drilling, and maintenance, but these roads are currently being used for similar activities. The proposed lay flat waterline and natural gas pipelines would replace water and gas trucking for the proposed operations. Because of the above, lands/access does not require detailed analysis.</p> <p>The proposed well pad and access road would be within the unit boundary; therefore, no rights-of-way would be required for those project components. The proposed lay flat waterline and natural gas pipelines would require a right-of-way and amendment respectively.</p> <p>The buried pipeline would be in a Public Water Reserve U0149840 in T. 11 S., R. 24 E., sec. 6, lot 8. Rationale for why effects to this water reserve would be below a level meriting detailed analysis are discussed in the “Municipal Watershed/Drinking Water Source Protection” checklist item below.</p>	Brandi Perry	04/19/24 07/03/24
PI	Lands with Wilderness Characteristics	Per GIS and RMP review, the well pad and pipeline upgrade occur partly in the White River lands with wilderness characteristics inventory unit. This resource was analyzed in detail in the document.	Jessica Farmer	05/29/24
NI	Livestock Grazing & Rangeland Health Standards	This project occurs in the active Asphalt Draw and Southam Canyon grazing allotments. The allotment is grazed by sheep from November 1 st to June 15th. Due to nature of herding sheep, the proposed surface disturbance would have no effect on livestock. The	Travis Decker	06/25/24

*	Resource/Issue	Rationale	Signature	Date
		proposed surface disturbance would not be expected to adversely affect Rangeland Health Standards because it would only be 29 acres relative to the total size of the two allotments. The proposed reclamation (see Section 2.2.4) should restore any AUMs lost to initial disturbance.		
NI	Paleontology	The project location is almost entirely (95%) on quaternary alluvial sediments of Potential Fossil Yield Classification (PFYC) 2, with some contact (5%) to the PFYC 5 Member A of the Uinta Formation. PFYC 2 units have low potential to contain paleontological resources and PFYC 5 units have very high potential. However, no ground disturbance would occur in PFYC 5 units, therefore no adverse effect to paleontological resources would be expected. If paleontological resources were encountered, activity in that location must stop and the BLM Vernal Field Office Authorized Officer must be notified.	Emily Lessner	05/24/24
NI	Plants: Invasive and Noxious Weeds	No noxious weeds were identified in the area, per BLM GIS data review. Invasive species: cheatgrass (<i>Bromus tectorum</i>), saltlover, (<i>Halogeton glomeratus</i>), and Russian thistle (<i>Salsola tragus</i>) were identified in and near the project area. The designed weed control (see Section 2.2.5) and reclamation (see Section 2.2.4) would address infestations of noxious weeds and invasive plants introduced or spread by the proposed construction. Invasive plants and noxious weeds were therefore eliminated from further analysis.	Travis Decker	06/25/24
NI	Plants: Native Communities	A total of 29 acres is proposed to be disturbed. This site was previously disturbed in a plugged and abandoned well pad. According to the Ecological Site Description for the area, the site is showing that it is in Semidesert Gravelly Sandy Loam (Wyoming Big Sagebrush). Within the general area, a total of 10,795 acres match or are similar with the ecological description of Wyoming Big Sagebrush. The Current Potential State is ecological function has not changed but the resiliency of the state has been reduced by the presence of invasive weeds and continued drought. No biotic thresholds have been passed or would be passed due to the proposed surface disturbance. Therefore, the proposed project would not adversely impact native vegetation to a level meriting detailed analysis.	Travis Decker	06/25/24

*	Resource/Issue	Rationale	Signature	Date
NP	Plants: BLM Sensitive	<p>The March 2024 Biological Survey Report by Environmental and Permitting Solutions documented no BLM Sensitive plant individuals in the project location.</p> <p>Per GIS review of potential habitat polygons and/or associated soils, potential habitats for Sterile yucca (<i>Yucca sterilis</i>), Graham's beardtongue (<i>Penstemon grahamii</i>), Hamilton's milkvetch (<i>Astragalus hamiltonii</i>), and Barneby's cryptanth, (<i>Cryptantha barnebyi</i>) are present in the project location. However, a BLM botanist conducted an onsite visit on July 3, 2024, and no BLM Sensitive plant individuals were identified in the project location.</p> <p>Therefore, no further analysis is necessary to disclose impacts to BLM Sensitive plant species.</p>	Travis Bitters	07/03/24
NP	Plants: Threatened, Endangered, Proposed, or Candidate	<p>Per GIS review, there are no threatened, endangered, proposed, or candidate plant species or habitat in the project area. A BLM botanist conducted an onsite visit July 3, 2024 and did not observe any individual plant species in those categories. Therefore, no further analysis is necessary.</p>	Travis Bitters	07/01/24
NI	Recreation	<p>Per GIS review, there are no developed or undeveloped recreation resources within the project area. Impacts to dispersed recreation would be near imperceptible due to the availability of similar dispersed recreation opportunities in adjacent areas. See Appendix C: AIB-2 Recreation for further details for additional information.</p>	Jessica Farmer	10/21/24
NI	Socioeconomics	<p>There are no communities within eight miles of the project areas and the project area is in the "Less than 50 percentile" category, which is considered not at risk, per ejscreen.epa.gov/mapper. Oil and gas development is an existing activity adjacent to the project location, so no measurable changes to existing socioeconomic conditions would be expected from the proposed action.</p>	David Gordon	06/17/24
NI	Soils: Physical/Biological	<p>The analysis area is the HUC-12 Center Fork Asphalt Wash-Asphalt Wash which is 21,197.7 acres in size. The proposed project is 28.6 acres in size or 0.14 percent of the analysis area. Per U.S. Department of Agriculture web soil survey, the proposed project occurs on Gilston sandy loam 2 to 8 percent slope (Map Unit Name). Gilston sandy loam is comprised of sandy loam, gravelly sandy loam, and gypsiferous loam. Soil type was confirmed on the onsite done on November 2, 2023. In the analysis area there is 1,006.3 acres of Gilston sandy loam. The proposed</p>	David Gordon	06/17/24

*	Resource/Issue	Rationale	Signature	Date
		project would disturb 28.6 acres (2.8%) of Gilston sandy loam. The erosion control techniques (see Section 2.2.4) and pad reinforcement (see Section 2.2.6) would reduce potential impacts to soils in disturbed areas until final reclamation is accomplished. Impacts to soils would not occur to an extent where additional analysis would be required.		
PI	Visual Resources	The project area occurs within Visual Resource Management (VRM) Classes II and IV.	Jessica Farmer	05/29/24
NI	Wastes (hazardous/solid)	No hazardous materials would be stored on location per Surface Use Plans of Operations. Therefore, no detailed analysis is required.	David Gordon	06/17/24
NI	Water Quality and Quantity (Surface and Ground)	The Proposed Action would result in water consumption and withdraw of water resources. See Appendix E: AIB-1 Water Quality and Quantity for further details for rationale due to data formatting.	Holly Mitchell	10/25/24
NI	Water: Hydrologic Conditions (stormwater)	<p>The impact analysis area for Hydrologic Conditions is the HUC-12 watershed (HUC 12 Boundary (Center Fork Asphalt Wash-Asphalt Wash (140500070704))) and the local 100-year floodplain and Asphalt wash that encompasses the proposed project. This covers approximately 21,193 acres. This boundary was chosen due to the availability of high-quality data. It reflects the hydrological system where the proposed project is and is representative of activities occurring in the larger watershed.</p> <p>Per onsite and GIS review Asphalt Washes is adjacent to the proposed well pad and pipelines. The proposed well pad and pipeline locations could drain into Asphalt Wash's active floodplain during storm events. The proposed pipelines would cross Asphalt Wash three times. The proposed natural gas pipeline would be buried below the active channel. The existing road typically requires blading after storm events where it crosses the wash. The existing pipeline would be removed. The BLM is not aware of an instance where the existing pipeline was ever broken or had to be re-buried due to a storm event. There are approximately eight additional well pads in the bottom of Asphalt wash. If there are contaminants or trash on the well pad, those could be picked up by any water flows exiting the pad, except where the berm would prevent water leaving the pad.</p> <p>However, impacts are reduced by applying the features described in Sections 2.2.1, 2.2.2, 2.2.4, and</p>	Holly Mitchell	10/25/24

*	Resource/Issue	Rationale	Signature	Date
		2.2.6 relating to erosion control, armoring the well pad adjacent to the wash, drilling fluids, berming of production facilities, and reclamation.		
NI	Water: Municipal Watershed / Drinking Water Source Protection	<p>The impact analysis area for Municipal Watershed/Drinking Water Source Protection is the HUC-12 watershed (HUC 12 Boundary (Center Fork Asphalt Wash-Asphalt Wash (140500070704))) that encompasses the proposed project. This covers approximately 21,193 acres. This boundary was chosen due to the availability of high-quality data. It reflects the hydrological system where the proposed project is and is representative of activities occurring in the larger watershed.</p> <p>Per GIS review, there are no protected Ground Water Zones of Protection located in the project location. The nearest one is approximately 26 linear miles northwest. Per GIS review, the project location is within a Surface Source Protection Zone 3 & 4, which means it is furthest from the source zone (the Green River Intake) that is used for municipal water. The public water reserve number UTU-0149840) in T. 11 S., R. 24 E., sec. 6, Lot 8 and Lot 10 has a water source that is a repurposed O&G well. The road and a 4-inch pipeline existing within the public water reserve boundary per GIS review. There is an additional 3,270 feet of road within the public water reserve boundary and about 135 feet from the water source. There is also an existing well within approximately 0.5 mile of the public water reserve. Distance between the road and the water source is 180 feet.</p> <p>About 580 feet of layflat and natural gas pipeline would intersect the public water reserve boundary per GIS review on its northwest corner. The layflat would be within the borrow ditch on the east side of the road and would be temporary with no new surface disturbance (Section 2.2.2). The proposed natural gas 10-inch pipeline would also pass through the Reserve boundary but in both Alternative B and Alternative C would be on the west side of the road when it enters the Reserve boundary, 200 feet from the water source. The lay flat line would run fresh water, so there would be no risk to the public water reserve if it were to rupture. Both alternatives would</p>	Holly Mitchell	10/25/24

*	Resource/Issue	Rationale	Signature	Date
		<p>replace an existing 4-inch natural gas pipeline with a proposed 10-inch natural gas pipeline, so risk of rupture and associated contamination through residual amounts of condensate within the pipeline also exists under the No Action alternative. As part of the design of the pipeline there is a shut off pressurized system to turn the pipeline off in case of a break.</p> <p>Because of the designed placement of the proposed pipelines and lay flat waterline, distance from the resources and Applicant-Committed Environmental Protection Measures described in Sections 2.2.3 and 2.2.6 pertaining to erosion control, drilling fluids, dust suppressants, and the definitions brought forth by the Utah DEQ drinking- water rules (https://documents.deq.utah.gov/drinking-water/rules/DDW-2018-003500.pdf), impacts to drinking water would be minimized.</p>		
NI	Water: Streams, Riparian, Wetlands, Floodplains	<p>The impact analysis area for Streams, Riparian, Wetlands, Floodplains is the HUC-12 watershed (HUC 12 Boundary (Center Fork Asphalt Wash-Asphalt Wash (140500070704)) that encompasses the proposed project. This covers approximately 21,193 acres. This boundary was chosen due to the availability of high-quality data. It reflects the hydrological system where the proposed project is and is representative of activities occurring in the larger watershed.</p> <p>According to the National Wetland Inventory accessed June 27, 2024, there are three types of wetlands/riparian resources near or intersecting the locations of the proposed well pad and pipelines. The local feature Asphalt Wash intersects the Uintah County claimed road, known as Asphalt Wash Road, multiple times as Riverine (R4SBJ). This means surface water is only present for variable periods without detectable seasonal periodicity. Weeks, months, or even years may intervene between periods of inundation. There are three ponds identified as Freshwater Emergent Wetland (PEM1A and PEM1Ah) on the east and north side of Asphalt Wash Road approximately 20-160ft from the existing road edge respectively. The surface water is present for brief periods (from a few days to a few weeks)</p>	Holly Mitchell	10/25/24

*	Resource/Issue	Rationale	Signature	Date
		<p>during the growing season, but the water table usually lies well below the ground surface for most of the season and/or these wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water. The lay flat line would run fresh water, so there would be no risk to the emergent wetlands if it were to rupture. Both alternatives would replace an existing 4-inch natural gas pipeline with a proposed 10-inch natural gas pipeline, so risk of rupture and associated contamination through residual amounts of condensate within the pipeline exists even under the No Action alternative. As part of the design of the pipeline there is a shut off pressurized system to turn the pipeline off in case of a break.</p> <p>Per GIS review, mapped 100-year floodplain and ephemeral washes are present in the proposed pad location and proposed pipeline routes. Approximately 2,761 feet (22%) of the proposed 10-inch pipeline upgrade and approximately 17,706 feet (40%) of the proposed lay flat waterline would intersect a mapped 100-year floodplain. In both Alternative B and Alternative C, the proposed 10-inch pipeline upgrade would be on the west side of the road instead of the east where it is parallel with the identified riparian area it could otherwise intersect. The lay flat waterline would be within the borrow ditch of the road and would be temporary with no new surface disturbance (see Section 2.2.2). For impacts to the floodplain, refer to the Hydrologic Conditions (Stormwater) section.</p> <p>The designed placement of the proposed pipelines and lay flat waterline, adherence to BLM Technical Note 423 (see Section 2.2.2) at stream crossings, armoring of the well pad, berming of the production facilities, and other measures described in Sections 2.2.1, 2.2.2, 2.2.4, and 2.2.6 pertaining to erosion control, drilling fluids, and dust suppressants, would reduce impacts to these resources.</p>		
NI	Water: Water Rights	The impact analysis area for Water Rights is within the HUC-12 watershed (HUC 12 Boundary (Center Fork Asphalt Wash-Asphalt Wash (140500070704))) that encompasses the proposed project, particularly within 100 meters of the proposed project. This boundary was chosen due to the availability of high-	Holly Mitchell	10/25/24

*	Resource/Issue	Rationale	Signature	Date
		<p>quality data and the distance from the proposed project in relation to local water rights in the area.</p> <p>Per GIS review there are approximately 15 water rights within 100 meters of the project location, mainly along the proposed lay flat waterline. The water proposed to be used would come from water rights #49-2398, #49-2445, #49-2449, and #49-2452. These water rights have been approved/certificated by the Utah State Engineer. Furthermore, the designed placement of the proposed pipelines and lay flat waterline, and measures described in Sections 2.2.1, 2.2.2, 2.2.3, 2.2.4, and 2.2.6 pertaining to erosion control, drilling fluids, and dust suppressants would reduce impacts to these resources. For more details regarding water usage, particularly for use of water from the White River, refer to Water: Quality and Quantity (Surface and Ground).</p>		
NP	Wild Horses	Per the Vernal RMP and GIS review, there are no Wild Horse Herd Areas or Wild Horse Management Areas with the project boundaries.	David Gordon	04/09/24
PI	Wildlife: Migratory Birds (including raptors)	<p>Migratory Birds:</p> <p>Per GIS review of district files numerous migratory bird species may migrate through or nest within the project area. The project actions should be planned to occur outside April 1 to July 15 to minimize impacts from the proposed disturbance during the nesting season. If the project area were monitored and surveyed by a BLM biologist or another approved biologist for nesting birds, and nests determined active were avoided by 100 feet, the proposed construction could commence during the nesting season with approval of the Authorized Officer.</p> <p>Raptors:</p> <p>Per GIS review of district files one raptor nest, species unknown, exists within 0.5 miles of the project area. Surveys completed by West Water Engineering confirmed an active great-horned owl nest, an un-occupied red tailed hawk nest and an un-occupied golden eagle nest. Species specific buffers and timing restrictions will apply per the 2008 Vernal RMP.</p>	Cambree Carroll	9/13/24
PI	Wildlife:	Water proposed to be used for this project is connected to a variety of water rights. In 1988, the	Tyler Arnold	07/01/24

*	Resource/Issue	Rationale	Signature	Date
	Fish (designated or non-designated)	<p>Upper Colorado River Endangered Fish Recovery Program (UCRRP) was created and in 1993 the UCRRP participants implemented a ESA Section 7 agreement. This agreement established the UCRRP and its activities as the reasonable and prudent alternative to avoid endangered fishes from being jeopardized by water depletions in the Upper Colorado River Basin. Water right #49-2452 was proofed prior to 1988 and is considered historic. Water rights #49-2398, #49-2445, and #49-2449 were all proofed after 1988 so the project would require consultation with USFWS because it would deplete more than 100 acre-feet from the Green River system. The proposed action would use 528 acre-feet (see Section 2.2.3).</p> <p>Designated Fish Species: There are no fish in the project location. However, water depletion from the Green River is a main contributing factor to the decline of Threatened and Endangered fishes of the Upper Colorado River system. The water for the proposed drilling, completions, and dust control would be sourced from the Green River watershed and ultimately deplete the Green River, which is critical habitat for endangered Colorado pikeminnow (<i>ptychocheilus Lucius</i>), razorback sucker (<i>xyrauchen texanus</i>), bonytail chub (<i>gila elegans</i>), and humpback chub (<i>gila cypha</i>).</p> <p>Non-designated Fish Species: The Green River is home to other native fish species within the system that are BLM special status species; flannelmouth sucker (<i>Catostomus latipinnis</i>), bluehead sucker (<i>Catostomus discobolus</i>), and roundtail chub (<i>gila robusta</i>). Effects to these fish would be similar to the effects on Threatened and Endangered fish species discussed above.</p>		
NI	Wildlife: Non-USFWS Designated	<p><i>Big Game</i></p> <p>Per review of UDWR GIS data, modeled mule deer substantial winter habitat is mapped within the project area. However, the Vernal RMP (2008) does not specify stipulations or mitigation measures for mule deer in this area. Four acres would be disturbed of the 368,880 acres within this Mule Deer Winter habitat unit. Per GIS review of district files there is no crucial winter mule deer or elk habitat within the</p>	Cambree Carroll	9/13/24

*	Resource/Issue	Rationale	Signature	Date
		<p>project area. The project is partially in substantial winter mule deer habitat.</p> <p><i>Greater sage-grouse</i></p> <p>Per GIS review of district files, no Greater sage-grouse habitat exists within the project area. Per GIS review of District files, the nearest Greater sage-grouse habitat is general habitat and 4.89 miles away. The nearest lek is 12.81 miles from the project.</p> <p><i>White tailed prairie dog</i></p> <p>Per GIS review of district files as well as the biological report from West Water Engineering LLC in June 2024 white tailed prairie dogs were not observed during the survey and no suitable habitat present in the survey area.</p>		
NP	Wildlife: Threatened, Endangered, Proposed or Candidate	Per review of BLM district files and GIS data, no threatened, endangered, proposed, or candidate terrestrial wildlife species, critical habitat, or suitable habitat, are identified within or near the proposed project area.	Cambree Carroll	09/13/24
NP	Woodlands/Forestry	There are no forest or woodland vegetation cover types in or around the project area per a BLM GIS review. Therefore, no detailed analysis is required.	David Palmer	04/12/24

Table Appendix A-2. Final Review

Reviewer Title	Signature/Date	Comments
Environmental Coordinator	<p>STEPHANIE HOWARD</p> <p>Digitally signed by STEPHANIE HOWARD Date: 2025.01.30 09:27:34 -07'00'</p>	
Authorized Officer	<p>GERALD KENCZKA</p> <p>Digitally signed by GERALD KENCZKA Date: 2025.01.30 10:33:18 -07'00'</p>	

APPENDIX B: GLOSSARY OF TERMS

AUTHORIZED OFFICER: The decision maker who has the delegated authority to for that decision.

BEST MANAGEMENT PRACTICES: A suite of techniques that guide, or may be applied to, management actions to aid in achieving desired outcomes.

CONDITIONS OF APPROVAL: Conditions or requirements under which a decision is made.

ENVIRONMENTAL ASSESSMENT: A concise public document that analyzes the environmental impacts of a proposed action and provides enough evidence to determine the level of significance of the impacts.

IMPACT: A modification of the existing environment caused by an action (such as construction or operation of facilities).

INTERDISCIPLINARY TEAM: Representatives of various disciplines designated as members of a team which was created to prepare an environmental document.

INVASIVE PLANTS: Plants that are not part of (if exotic) or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth is not actively controlled by management interventions.

MINIMIZE: To reduce the adverse impact of an operation to the lowest practical level.

MITIGATION: Steps taken to 1) avoid an impact; 2) minimize an impact; 3) rectify an impact; 4) reduce or eliminate an impact over time; or, 5) compensate for an impact.

MONITORING: The process of collecting and assessing data/information necessary to evaluate the effectiveness of a decision or its conditions of approval.

PERMIT: A revocable authorization to use public land for a specified purpose for a specified period of time.

PROJECT AREA: The area of land potentially affected by a proposed project.

RECLAMATION: Re-establishing desirable plants on areas where desirable plants are absent or of inadequate density, by management alone (natural revegetation) or by seeding or transplanting (artificial revegetation).

SIGNIFICANCE: A determination of the degree or magnitude of importance of an effect, whether beneficial or adverse.

VALID EXISTING RIGHTS: Rights that existed before a change in law, policy, or plan that would not be altered by that change.

APPENDIX C: COMMONLY USED ACRONYMS

The below table contains a list of acronyms and their meanings that are frequently used by the BLM and which may have been used in the writing of this document.

Table 5-1. Acronym Meanings

Acronym	Meaning
%	Percent
AEO	Annual Energy Outlook
APE	Area of Potential Effect
AMR	BLM Utah 2023 Air Monitoring Report
AQRV	Air Quality Related Values
ARMPA	Approved Resource Management Plan Amendment
ARMS	Air Resource Management Strategy
AUM	Animal Unit Month
BLM	Bureau of Land Management
BLM-OGD	Projected Oil and Gas Development Activities Under BLM Jurisdiction in Uintah and Duchesne Counties
BMP	Best Management Practice
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CWA	Clean Water Act
DR	Decision Record
dV	Deciview
EIA	U.S. Energy Information Administration
EPA	Environmental Protection Agency
E.O	Executive Order
EUR	Estimated Ultimate Recovery
FIP	Federal Implementation Plan
GIS	Geographic Information System
GHG	Greenhouse Gases
GWP	Global Warming Potential

Acronym	Meaning
HAP	Hazardous Air Pollutants
HI	Hazard Index
HQ	Hazard Quotient
IDT	Interdisciplinary Team
IMPROVE	Interagency Monitoring of Protected Visual Environments
IPCC	Intergovernmental Panel on Climate Change
kg/ha-yr	Kilogram Per Hectare Per Year
km	Kilometers
LCA	Life Cycle Assessment
MBTA	Migratory Bird Treaty Act
Mt	Megatonnes
N ₂ O	Nitrous Oxide
NAA	Non-attainment Areas
NAAQS	National and Utah Ambient Air Quality Standards
NDC	National Determined Contribution
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NI	Not Impacted
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NP	Not Present
NRHP	National Register of Historic Places
O ₃	Ozone
Onsite	Onsite Inspections per Onshore Order #1
PIF	Partners in Flight
PM ₁₀	Particulate Matter with diameters that are generally 10 micrometers and smaller
PM _{2.5}	Particulate Matter with diameters that are generally 2.5 micrometers and smaller
ppb	Parts Per Billion
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
PUP	Pesticide Use Proposal
REL	Reference Exposure Level
RCP	Representative Concentration Pathways
RFC	Reference Concentration

Acronym	Meaning
RFD	Reasonably Foreseeable Development
RMP	Resource Management Plan
SARA	Superfund Amendments and Reauthorization Act
SC-GHG	Social Cost of Greenhouse Gases
SHPO	State Historic Preservation Office
SO ₂	Sulfur Dioxide
SO _x	Sulfur Oxides
THPO	Tribe Historic Preservation Office
TLA	Utah Trust Lands Administration
Tonnes	Metric Tons
TSL	Toxic Screening Level
UDAQ	Utah Division of Air Quality
UDWR	Utah Division of Wildlife Resources
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	Volatile Organic Compounds
VRM	Visual Resource Management

APPENDIX D: PUBLIC COMMENT RESPONSE

The below tables list the substantive public comments received during the public comment period, and the responses to those comments. The comments are sorted by resource topic.

GENERAL COMMENTS

Table D-1: General Comments

GENERAL COMMENTS	
COMMENT	RESPONSE
The public requests landmarks be added to the maps such as water bodies and nearby structures and trails, and that maps be added for wildlife, LWC, and other O&G development.	There are no nearby structures and trails to be added to the maps. The closest water body is the White River which is on the map and labeled (See Figures 2.2, 2.3, and 2.4). A map for migratory birds and raptors was not added because the entire field office is habitat for both. A map for endangered fish was not added because their habitat is the White River, which is already on three of the four original figures. Figures were added for LWC analysis (see Section 3.4.1). Figures were added for oil and gas development (see Figure 1-1).
The public requests the BLM replace ambiguous language from the BMPs such as "as much as possible" and "as soon as possible" with more specific, enforceable targets.	The measures that have specific, enforceable targets are worded with those targets. The measures that have words such as "where feasible" have circumstances where they may not be feasible, so the wording cannot change, but the impacts of not implementing the measure were considered in the analysis.
<p>The public requests BLM consider requiring the following additional measures or document what the impacts may be without them:</p> <ol style="list-style-type: none"> 1. Prohibition of pits and evaporation ponds; 2. Synthetic liners and groundwater monitoring for any allowed storage pits/ponds, and requirements for proper operation and closure; 3. Flowback and stimulation fluids contained within tanks that are placed on a well pad or in an area with downgradient perimeter berms; 4. Berm construction or other containment devices around crude oil, condensate, and produced water storage tanks, sufficient to contain and provide secondary containment for 150% of the largest single tank; 5. Treatment of any process water utilized or produced during hydraulic fracturing/completion, drilling, pressure testing, completion, pigging, and production phases, prior to disposal of these wastewaters; 6. Berms or other secondary containment devices that are sufficiently impervious to contain any spilled or released material; 	<ol style="list-style-type: none"> 1. No reserve pits are associated with this project. There are no evaporation ponds associated with this project. 2. There are no storage pits or ponds associated with this project. 3. Section 2.2 has been updated with tank containment information. 4. Section 2.2 has been updated with containment information. The containment is 110% per 40 CFR 112.6(a)(3)(ii). 5. Section 2.2.3 discusses disposal of the fluids. No treatment is planned prior to disposal. 6. Section 2.2. has been updated with containment information. 7. As explained in Appendix A, there are no underground sources of drinking water in the project area. The nearest is 26 miles away. 8. As explained in Appendix A, there are no underground sources of drinking water in the project area. The nearest is 26 miles away. However, running cement bond logs is standard industry practice.

GENERAL COMMENTS	
COMMENT	RESPONSE
<p>7. Use of fresh water-based muds or an air process when drilling through underground sources of drinking water (USDW);</p> <p>8. Running of cement bond logs or other appropriate logging to ensure cement effectively isolates USDWs, including when a lost circulation event occurs on surface casing.</p>	
The public requests the BLM prepare a project monitoring and compliance plan.	BLM's monitoring and compliance is defined in BLM's annual Inspection and Enforcement Strategy Instruction Memorandum. IM 2025-001
The public points out that the nearest residential buildings are five miles away, and the nearest community is eight miles away, and there are several wells within 1 mile.	Section 1.0 has been updated with this information.
The public points out that the project is in conformance with the State Resource Management Plan policies and Utah's 10-year Strategic Energy Plan 2.0.	Section 1.4 has been updated with this information.
The public points out that the project is in conformance with the Uintah County Resource Management Plan.	This information is contained in Section 1.4.
The public points out inconsistencies between Section 2.2.4 data and Table 2-2 figures.	Section 2.2.4 has been updated with the correct information from Table 2-2.
The public requests the BLM defer decision on the Drumlin APD pending the outcome of the litigation against the lease.	Chapter 1 has been updated with information regarding the litigated leases. The BLM added Section 2.4.4 which discusses deferral of the decision pending litigation outcome.
The public requests that BLM consider an alternative where BLM would approve four of the APDs under two phases and deny the remainder to reduce GHG emissions and water use.	The BLM added Section 2.4.5 which discusses deferral of the four APDs pending litigation outcome. The proposed action includes phased drilling of the APDs.
The public requests the BLM explain the role of the Drumlin project in relation to the Glacier (Deep) unit.	Section 1.0 has been updated with the requested information.
The public requests that the cumulative impact analysis disclose whether adjacent O&G development is a connected action to the proposed action.	All connected actions to the Drumlin development are described in Sections 2.2 and 2.3. However, information on adjacent O&G development has been added to chapter 1. All are previously drilled projects, so do not require a federal decision and therefore are not connected actions.
<p>The public requests that the BLM update the cumulative impact analyses to include the operating or maintaining of the following projects with the overall impacts of the Drumlin Project:</p> <ul style="list-style-type: none"> Oil and gas development in the Glacier (Deep) Unit (UTUT106367776), including drilling the obligation well(s), to the extent that the Drumlin Project does not satisfy the Glacier Unit's obligations. As part of the approved unit agreement, BLM knows the Section, Township, and Range in which the obligation well(s) will be drilled and thus, this activity is reasonably foreseeable even if no APD has been submitted; 	<ul style="list-style-type: none"> Air Quality: The air quality cumulative impacts section quantifies the past, present, and reasonably foreseeable emissions in Duchesne and Uintah counties and references the regional air models for federal land in Utah. Therefore, the emissions from the comment-enumerated projects are accounted for even though they are not listed by name. Greenhouse Gases: The GHG cumulative impacts section references the Annual GHG Report and includes GHG emissions from federal onshore development which includes past, present, and reasonably foreseeable emissions on federal mineral estate. Therefore, the emissions from the comment-

GENERAL COMMENTS	
COMMENT	RESPONSE
<ul style="list-style-type: none"> Oil and gas development in the Canvas (Deep) Unit (UTUT106353986), including drilling the obligation well(s). As part of the approved unit agreement, BLM knows the Section, Township, and Range in which the obligation well(s) will be drilled and thus, this activity is reasonably foreseeable even if no APD has been submitted; Oil and gas development in the Tarn (Deep) Unit (UTU-95797X), including drilling the obligation well(s). As part of the approved unit agreement, BLM knows the Section, Township, and Range in which the obligation well(s) will be drilled and thus, this activity is reasonably foreseeable even if no APD has been submitted; The RW 33-22 Well Pad, DOI-BLM-UT-G010-2023-0116-EA; The Middle Fork Five RW Well Pads and Trunkline, DOI-BLM-UT-G010-2024-0006-EA; The Middle Fork RW 32-23 Well Pad, DOI-BLM-UT-G010-2023-0115-EA; The Dobby Well Pad, DOI-BLM-UT-G010-2023-0071-EA; The Bierstadt Fed 1123-16 Pad, DOI-BLM-UT-G010-2023-0017-EA; The ten reasonably foreseeable wells predicted in the Leasing EA for the lease at issue (parcel 155), as well as nearby leases (e.g., parcels 152-54, 156, 180, 233-34, all of which were sold). See Leasing EA App. F 	<p>requested projects are accounted for even though they are not listed by name.</p> <ul style="list-style-type: none"> Migratory Birds, Raptors, and Habitats: The listed projects are not within the issue analysis area (a 1-mile buffer around the project area) so the BLM did not include them in the cumulative effects analysis. BLM Natural Areas: The listed projects are not within the issue analysis area (the BLM Natural Area boundary), so the BLM did not include them in the cumulative effects analysis. Lands with Wilderness Characteristics: The listed projects are not within the issue analysis area (the LWC unit boundary), so the BLM did not include them in the cumulative effects analysis. Visual Resources: The listed projects are not within the issue analysis area (a 1-mile buffer around the project area) so the BLM did not include them in the cumulative effects analysis. Endangered Fish and Habitat: The endangered fish and habitat cumulative impacts section references the 2015 U.S. Geological Survey's Estimated Use of Water in the United States in 2015 and includes total surface and ground water use in Daggett, Duchesne, and Uintah Counties. This high-quality data quantifies total annual water withdrawals from mining (including oil and gas) in a single year and expresses the Proposed Action consumption as a percentage of amount to estimate effects. The BLM notes the withdrawals from the comment-enumerated projects did not occur in 2015, the year of the report, so they are not within the analysis timeframe.

AIR AND CLIMATE COMMENTS

Table D-2: Air and Climate Comments

AIR AND CLIMATE COMMENTS	
COMMENT	RESPONSE
The public requests that the incorporation by reference of the 2023 Utah BLM Air Monitoring report summarize the incorporated information, include page- or table-specific references, and include links to the document through the project website.	Information from the Utah BLM Air Monitoring report is summarized throughout the document (see Section 3.1.5) and includes specific page, table, and figure references.
The public requests that design values for all criteria pollutants for which monitoring data are available be	Design Values have been included in Section 3.1.1.

AIR AND CLIMATE COMMENTS	
COMMENT	RESPONSE
included in the affected environment. The data is available in EPA's Air Quality System.	
The public points out that the values in Tables 3-1 and 3-2 were incorrectly calculated. The public requests that the BLM's calculations account for non-point and point sources in the counties of interest including Indian Country.	Tables have been updated to include non-point, point, and Indian Country sources.
The public recommends the BLM include a summary of AQRV data from nearby monitors to better understand impacts and risks: Dinosaur National Monument, Arches, and Canyonlands.	A reference to where this information can be found has been added to Section 3.1.1.
The public requests the BLM compare AirToxScreen 2019 data with AirToxScreen 2020 data and disclose any differences.	While the EPA has published the 2020 version of AirToxScreen, the BLM is continuing to use the 2019 version. The 2020 AirToxScreen does not include county or state level cancer risk factors, nor does it have non-cancer risk values (i.e. hazard index) despite the documentation saying that this data is available (EPA,2024c). This missing information calls into question the completeness of the 2020 version and until these issues are resolved the BLM will continue to use the 2019 version as it is the most representative information to date.
The public requests the BLM revise Table 3-3 to include a year-by-year accounting of emissions attributable to the proposed action.	Information has been added to the table as a footnote and additional language to better describe years that emissions would occur has been added to Section 3.1.3.
The public requests the BLM disclose emissions in tons per year, not total tons. They also request a high-level summary of how emission estimates are calculated using EMIT.	The table has been updated to disclose emissions in tons per year. Information on how emissions estimates were calculated has been added to Section 3.1.3. Emissions estimates in the table have also been updated to reflect the most current information available from the operator.
The public requests BLM conduct a near-field air quality assessment using AERMOD or include impact estimates from an available relevant assessment.	The ARMS model (described in Section 3.1.5) projected localized air quality related impacts from future oil and gas development, including emissions from the Proposed Action.
The public requests that the BLM include additional information on how emissions estimates were determined to support the de minimis determination. The public requests the BLM include details on any New Source Review permitted sources associated with the proposed action, and all other proposed action emissions such as pipeline installation or upgrades.	Permitted sources that are not applicable to general conformity review for equipment operating under the proposed action are described in Section 3.1.3.1. Information on sources, project phases (including pipeline installation), and how emissions were estimated is included in Section 3.1.3. Additionally, emissions considered for general conformity purposes have been updated to reflect the most currently available information from the operator.
The public requests the BLM consider Tier IV engines instead of Tier II or higher.	Tier IV drill rigs are not currently feasible for the Uinta Basin as there are not any available or in use in the area. Additionally, well site electrification is not possible on a large scale since power transmission into the Uinta Basin is near its maximum capacity. Further, as noted in Section 3.1.3.1, maximum year emissions would not exceed de minimis limits, therefore tier IV

AIR AND CLIMATE COMMENTS	
COMMENT	RESPONSE
	rig engines are not necessary to remain under de minimis limits.
The public requests the BLM clarify what research or data support the assumption of a speed limit of 25 miles per hour for dust control purposes.	A reference to this information has been added to 3.1.3.2.
The public requests the BLM remove the operator's commitment to obtain air permits and follow regulatory requirements from the best management practices list because it is required by law.	This statement has been removed.
The public requests the BLM disclose whether the project GHG emissions are consistent with state, national, and international reduction goals and the 2050 netzero pathway.	Section 3.2.5 discloses all BLM oil, gas, and coal contributions, including the Proposed Action, to warming under the 2050 net-zero pathway and the IPCC's "middle of the road" scenario. Additionally, GHG emissions estimates associated with the Proposed Action have been updated to reflect the most current information available from the operator.
The public requests the BLM calculate SC-GHG using the EPA's new discount rates from their November 2023 Report on the Social Cost of Greenhouse Gases instead of using IWG estimates.	The EA has been updated to include EPA's new discount rates in the SC-GHG estimates.
The public points out the non-attainment area is designated as "marginal".	See Section 3.1.3.1. This clarification has also been added to Section 3.1.1.
The public requests the BLM consider the IPCC Climate Change 2023 Synthesis Report	The IPCC 2023 Synthesis Report is cited in the Annual GHG Report which has been incorporated by reference in this document.

WATER COMMENTS

Table D-3: Water Comments

WATER COMMENTS	
COMMENT	RESPONSE
The public requests the BLM disclose distances to water resources, add a map depicting the development with the Public Water Reserve UTU-0149840, and discuss risks to the public water resources.	The map in Section 2.3 shows the location of the public water reserve. The BLM updated Appendix A, the Water: Municipal Watershed / Drinking Water Source Protection row, with additional information about the public water reserve.
The public requests the BLM include a water resource management plan.	The APD contains a plan for produced water disposal. Its main points are summarized in Section 2.2.3.
The public requests the BLM analyze the feasibility of using recycled water to mitigate impacts to fresh water.	This was added to the alternatives considered but dismissed. See Section 2.4.2 and 2.4.3.
The public requests that the BLM consider the following stormwater mitigation measures, discuss when they would apply, and how the BLM would monitor and enforce them, as well as disclose impacts to water quality and aquatic resources: <ul style="list-style-type: none"> • silt fences, • detention ponds and other stormwater control measures, and • measures to prevent drilling fluid contaminants from entering waters of the U.S. 	Section 2.2.6 contains the operator's commitment to armor the well pad, which would perform the same and additional functions as a silt fence. Section 2.2 contains the operator's commitment to use a closed loop system, which negates the need for a reserve pit, a detention pond, and other measures to prevent drilling fluids from entering waters of the U.S. The BLM's onsite of the well pad did not identify any other reasons to install a detention pond.

WATER COMMENTS	
COMMENT	RESPONSE
The public points out that water rights used for drilling should be checked by Utah Division of Water Resources eastern regional office.	The BLM checked the water right against Utah Division of Water Resource's website, waterrights.utah.gov . The water rights are valid according to that website.
The public requests the BLM analyze site specific impacts to water resources (surface water, water quantity, groundwater, stormwater, streams, riparian wetlands, floodplains, and the impacts of that water use on the surrounding environment), including cumulative impacts, as promised in the leasing EA DOI-BLM-UT-G010-2018-0044-EA.	The BLM added site-specific water impact analysis, including information on White River water use, to the EA. See Appendix E Section AIB-1.
The public requests the BLM add support to or remove the statement that the various design features would "reduce impacts to [water] resources below a level requiring detailed analysis".	The BLM added site-specific water impact analysis, including information on White River water use, to the EA. See Appendix E Section AIB-1.
The public requests that the BLM quantify and analyze the cumulative impacts of water usage on the environment (not just fish) including comparing this water use to the total anticipated water use in the Lower White watershed.	The BLM added site-specific water impact analysis, including information on White River water use, to the EA. See Appendix E Section AIB-1.
<p>The public provided a list of six projects totaling 34 gas wells within the Lower White watershed, HUC 14050007 (the Drumlin well pad is also located in the Lower White watershed) that are cumulatively estimated to use over 1,000 acre-feet of water with the request that BLM include them in the cumulative analysis. These include:</p> <ul style="list-style-type: none"> • The RW 33-22 Well Pad, DOI-BLM-UT-G010-2023-0116-EA. This project includes the drilling of three gas wells. In its EA, BLM quantified the water use for the three wells to be 59 acre-feet • The Middle Fork Five RW Well Pads and Trunkline, DOI-BLM-UT-G010-2014-0006-EA. This project includes the drilling of eighteen gas wells. In its EA, BLM quantified the water use for the eighteen wells to be 351 acre-feet • The Middle Fork RW 32-23 Well Pad, DOI-BLM-UT-G010-2023-0115-EA. This project includes the drilling of three gas wells. In its EA, BLM quantified the water use for the three wells to be 60 acre-feet • The Dobby Well Pad, DOI-BLM-UT-G010-2023-0071-EA. This project includes the drilling of thirty-two gas wells. In its EA, BLM quantified the water use for the thirty-two wells to be 608 acre-feet • The Bierstadt Fed 1123-16 PAD, DOI-BLM-UT-G010-2023-0017-EA.³³ This project includes the drilling of two new oil and gas 	<p>The BLM added analysis of water consumption, see Appendix E Section AIB-1, using DOGM's water consumption data for the HUC-10 watershed. This data is more comprehensive than this list of six projects. The comment requested BLM analyze a HUC-8 level watershed (an 1,743,660-acre area), but the BLM used a HUC-10 watershed (a 122,848-acre area) to avoid impact dilution. Due to the smaller analysis area, some of these projects are not within the analysis area. Also, the impact indicator provided in this comment (acre-feet) doesn't match the impact indicator used in the EA (acre-feet per day), which makes the comparison of this data to the effects analysis in the EA difficult.</p>

WATER COMMENTS	
COMMENT	RESPONSE
<p>wells. In its EA, BLM did not quantify the water use for the two wells</p> <ul style="list-style-type: none"> The Weaver Canyon Well Pad, DOI-BLM-UT-G010-2023-0067-EA.37 This project includes the drilling of one oil and gas well. 	
<p>The public requests that the BLM quantify and analyze the cumulative impacts of reasonably foreseeable development scenario ("RFDS") wells on water usage and the environment including the Vernal RMP RFDS of 6,530 wells, and the Greater Uinta Basin Technical Support Document of 28,417 wells.</p>	<p>The RFDS scenario has a different timeframe (the life of the plan) which makes the comparison of the RFDS total water consumption to the effects analysis in the EA difficult. The RFDS also does not include a projection of water consumption for its 6,530 wells, and drilling techniques (and associated water consumption) have changed over time. Similarly, the Greater Uinta Basin Technical Support Document was developed to estimate surface disturbance, it spans a different timespan (the life of its enumerated projects, which is roughly 30 to 50 years) and it did not include water use estimates. In both cases, BLM would have to assume how much water is associated with the well estimates in those documents. Instead, the BLM elected to rely on the high-quality data in the U.S. Geologic Survey report which quantifies total surface and ground water use for 2015 in Daggett, Duchesne, and Uintah Counties for the Appendix E Section AIB-1 water impact analysis.</p>

WILDLIFE COMMENTS

Table D-4: Wildlife Comments

WILDLIFE COMMENTS	
COMMENT	RESPONSE
FISH	
The public requests the BLM disclose the effects to listed fish species from water depletion.	The effects from water depletion to listed fish species are explained in Section 3.7.3.
The public requests the BLM analyze the feasibility of using recycled water to mitigate impacts to fish species.	The use of recycled water was added to the alternatives considered but dismissed. See Sections 2.4.2 and 2.4.3.
The public requests the BLM explain how they would monitor and enforce the fish measures such as preparing a project monitoring and compliance plan.	BLM's monitoring and compliance is defined in BLM's annual Inspection and Enforcement Strategy Instruction Memorandum IM 2025-001. In addition, the recovery program conducts samples and reports on success.
The public requests deletion of the repeated words "the proposed" in Section 3.7.1.	Change made.
The public requests the BLM include a reference supporting the statement that water depletions lead to decreasing success of native fish in the Upper Colorado River system.	The BLM added Pennock, et. al. 2022 to Section 3.7.1.
The public requests the BLM change the word "decrease" to "decreased" in Section 3.7.1.	Change made.

WILDLIFE COMMENTS	
COMMENT	RESPONSE
The public requests the BLM change the word "closes" to "closest" in Section 3.7.1.	Change made.
The public requests the BLM summarize in the EA and append to the EA the ESA consultation.	Section 4.1 has been updated with the requested information.
The public requests the BLM demonstrate how the proposal is consistent with the ESA consultation.	Section 4.1 has been updated with the requested information.
GREATER SAGE-GROUSE	
The public requests the BLM include in the decision any applicable sage-grouse RMP requirements from the ongoing RMP Effort.	The Sage-Grouse RMP will not affect valid existing rights. See Section 1.5 of the Proposed RMP Amendment and Final EIS. In addition, Appendix A has been updated to show that no greater sage-grouse habitat is found within the project area.
The public requests the EA evaluate impacts of the project on greater sage-grouse populations.	Appendix A has been updated to show that no greater sage-grouse habitat is found within the project area.
The public requests the BLM include measures to prevent GRSG population decline, habitat fragmentation, and degradation, and protect GRSG breeding, nesting, brooding, and wintering habitat.	Appendix A has been updated to show that no Greater sage-grouse habitat is found within the project area.
GENERAL WILDLIFE	
The public requests the BLM include any wildlife-related stipulations from the 2008 Vernal RMP including greater sage grouse, antelope, elk, deer, and other species of concern.	The only timing stipulations that would apply to this project from the 2008 Vernal RMP would be migratory bird including raptors, timing, and physical buffers when nests are found to be active. These are included in Section 3.3.3.1.
The public requests the BLM analyze an alternative that would prohibit surface disturbance and permanent aboveground facilities within 660 feet of prairie dog colonies identified within prairie dog habitat with no opportunity for an exception, modification, or waiver to protect important habitats and minimize impacts.	Appendix A has been updated to show that no white tailed-prairie dog habitat is located within the project area, nor within a 660-foot buffer.
The public requests the BLM analyze an alternative that would prohibit surface disturbing activities in deer and elk crucial winter range from December 1 through April 30 with no opportunity for an exception, modification, or waiver to protect important habitats and minimize impacts.	There is no crucial winter mule deer or elk habitat within the project area. The project is partially in substantial winter mule deer habitat. Appendix A has been updated to reflect this information.
The public requests the BLM analyze an alternative that would prohibit exploration, drilling, and other development in crucial elk calving and deer fawning habitat from May 15 through June 30 with no opportunity for an exception, modification, or waiver to protect important habitats and minimize impacts.	No crucial elk calving and or deer fawning habitat is located within the project area. Appendix A has been updated to reflect this information.
The public requests the BLM analyze an alternative that would restrict surface disturbing activities during the species specific timeframes within 1/2 mile of ferruginous hawk nests (Mar 1 - Aug 1), within 1/2 mile of northern goshawk nests (Mar 1 - Aug 15), within 1/4 mile of short eared owl nests (Mar 1 - Aug 1), and within 1.4 mile of burrowing owl nests (Mar 1 - Aug 31) with no opportunity for an exception,	No ferruginous hawk, northern goshawk, short eared owls, or burrowing owls were found during the 2024 biologic survey done by West Water Engineering. Please see Appendix A for species buffers that are applicable as well as Section 3.3.3.1 for migratory bird mitigation.

WILDLIFE COMMENTS	
COMMENT	RESPONSE
modification, or waiver to protect important habitats and minimize impacts.	

SOILS AND VEGETATION COMMENTS

Table D-5: Soils and Vegetation Comments

SOILS AND VEGETATION COMMENTS	
COMMENT	RESPONSE
The public requests the BLM analyze impacts to vegetation, as promised in the leasing EA DOI-BLM-UT-G010-2018-0044-EA.	The site-specific analysis in Appendix A: Plants: Native Communities has been expanded.
The public requests the BLM analyze impacts to soils, as promised in the leasing EA DOI-BLM-UT-G010-2018-0044-EA.	The site-specific analysis in Appendix A: Soils: Physical/Biological has been expanded.

RECREATION, VIEWSHED, NOISE, NATURALNESS, SOLITUDE IMPACTS

Table D-6: Recreation, Viewshed, Noise, Naturalness, Solitude Comments

RECREATION, VIEWSHED, NOISE, NATURALNESS, SOLITUDE COMMENTS	
COMMENT	RESPONSE
The public requests the BLM analyze noise and viewshed impacts to White River recreationists (rafters and campers) including recreationists seeking naturalness, solitude, and primitive, unconfined recreation in the natural area and LWC unit. The public provided noise and viewshed analyses for the BLM's use.	Impacts to the White River were discussed in Appendix A: Designated Areas: Wild and Scenic Rivers as well as in Appendix E: Section AIB- 2. See 3.4.3 for analysis of potential sound and visual impacts to BLM Natural areas and LWC.
The public requests the BLM define "dark sky-friendly lighting" and explain how that lighting will minimize impacts to darkness of the night skies.	<p>A properly designed and installed lighting fixture that follows the six guiding principles as defined in BLM Tech Note 457 are considered dark sky friendly. Those principals include:</p> <p>Light only if needed:</p> <ul style="list-style-type: none"> • Use alternatives to permanent lighting. • Use lighting control technologies. • Shield lights and direct them properly. <p>Light color matters:</p> <ul style="list-style-type: none"> • Select amber, orange, or red whenever possible. <p>Use the minimum level of illumination necessary:</p> <ul style="list-style-type: none"> • Avoid over-illumination. <p>Use energy-efficient lights and advanced lighting controls:</p> <ul style="list-style-type: none"> • Save energy while adding useful lighting capabilities. (Sullivan, 2023) <p>Application of the principles set forth in BLM Tech Note 457, reduce or eliminate lighting being directed in unwanted directions including that lighting that would be directed skyward causing undesirable skyglow.</p>

RECREATION, VIEWSHED, NOISE, NATURALNESS, SOLITUDE COMMENTS	
COMMENT	RESPONSE
	<p>These principles will also reduce impact of the facilities on the surrounding landscape during night hours.</p> <p>Sullivan, R., N. Glines-Bovio, K.N. Rogers, J.H. McCarty, D. Korzilius, and H. Hartmann. 2023. Night Sky and Dark Environments: Best Management Practices for Artificial Light at Night on BLM-Managed Lands. Tech Note 457. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, CO.</p>
The public requests that the Drumlin EA cumulative analysis describe the impacts of operating the existing pipeline or maintaining the existing Southam Cyn 10-24-13-30 well pad (the only two actions identified in the White River Natural Area), nor does it discuss the overall impacts of the Drumlin Project when viewed together with the other two identified projects.	Section 3.4 has been updated to reflect these impacts.

APPENDIX E: ISSUES ANALYZED IN BRIEF (AIB)

AIB-1 WATER QUALITY AND QUANTITY

AIB-1.1 ANALYSIS AREA

The impact analysis area for Water Quality and Quantity (Surface and Ground) is the HUC-10 watershed (HUC 10 Boundary (Asphalt Wash-White River (1405000707))) that encompasses the proposed project. This covers approximately 121,848 acres. This boundary was chosen due to the availability of high-quality data. It reflects the hydrological system where the proposed project is and is representative of activities occurring in the larger watershed.

The proposed wells and associated infrastructure would not be in or over any sensitive ground water recharge zones, per GIS data layers. The nearest Groundwater Source Protection Zone is located approximately 26 linear miles northwest of the proposed well pad. Surface water occurs in the project location during precipitation or snow melt events per review of GIS aerial imagery.

AIB-1.2 THREE-COUNTY WATER USE SUMMARY

The 2015 U.S. Geological Survey (USGS) report, Estimated Use of Water in the United States in 2015 (Dieter et al. 2018), estimates total surface and ground water use for 2015 in Daggett, Duchesne, and Uintah Counties is 645,688 acre-feet per year (ac/ft per year). Less than 1% (0.83%, 5,342 ac/ft per year) of total water use in the Uinta Basin is attributable to mining, the category which oil and gas operations are reported. The proposed wells would use approximately 528 acre-feet total (less than 0.08% of the 3-county total water use) of water from the water right shown in Section 2.2.3 (the total number includes drilling completion and any dust control water use). This analysis of the 528 acre-feet assumes all water used would come from the water rights (for analysis of the water rights, see the Water Rights Section of Appendix A), however the company may elect to use recycled water for all or a portion of their water needs. Cumulatively the largest water use categories in the three counties are irrigation (90.4%, 583,507 ac/ft per year), followed by aquaculture (4.53%, 29,220 ac/ft per year). (Dieter et al. 2018).

AIB-1.3 PROJECT WATER RIGHTS AND WHITE RIVER FLOW

Water obtained from the project's water rights would come from the White River or underground wells located off the bank of the White River. USGS's water gauge called White River near Watson (USGS09306500) is at nearly the same location as the majority of the points of diversion for the water rights. As of October 24, 2024, that gauge registered a flow of 476 cfs (943 acre-feet per day or approximately 344,608 acre-feet per year) (Note, there are other varying factors such as dams and other water users upstream the water gauge reader, and seasonal flows). Statistics for October 24, 2024, based on 95 years of data (USGS 2024) read a mean of 451 cfs (894 acre-feet per day) and ranged from a low of 273 cfs (541 acre-feet per day) in 1935 to a high of 1,670 cfs (3,310 acre-feet per day) in 1929. The highest flow rate month tends to be June, where flow rates median 1,850 cfs, (3,667 acre-feet per day) while the lowest tends to be January where rates decrease to a median of 330 cfs (654 acre-feet per day) (USGS 2024).

As shown in Table AIB-1-1 the company estimates it would take 10 days to collect the water needed (for an average 5.6 acre-feet/day per well) for the proposed project. Completion operations for most wells in the Uinta Basin (based upon local BLM historic run time and data), utilize a maximum of approximately 70 barrels per minute to fracture stimulate the wells. (one (1) barrel equates to 42 US gallons and 325,851 US gallons to 1 acre-foot) (Note: These pump rates can vary based on geologic formations, well bore design, pressure, type of well, etc.). If the flow of the river is at its lowest when the water is withdrawn, the withdraw rate per well is 1% of the lowest river flow rate. This would result in reduced impacts of drawdown of water resources and of available water resources for wildlife, vegetation, springs, streams, or public consumption. The water right in Section 2.2.3 has been approved by Utah Division of Water Rights for of water for industrial use/oil exploration.

Table AIB1-1: Water Withdrawal Rate Estimates

Water Withdrawal Rate Estimates*		
Rates	2 wells simultaneous pumping rate	1 well pumping rate
Frac Pump Rate	70 bbl/min	70 bbl/min
Minutes Pumped per day	1,245 mins/day*	622.5 mins/day*
Barrels Pumped per day	87,150 bbl/day	43575 bbl/day
Gallons pumped per day	3,660,300 gal/day	1,830,150 gal/day
River Rate	541 acre-ft/day	541 acre-ft/day
Frac Pump Draw Rate	11.2 acre-ft/day (pumps at 70 bbl/min)	5.6 acre-ft/day (pumps at 70 bbl/min)
Draw Rate Percent of River Rate	2 percent	1 percent
*Based upon BLM data, historic run time, and pumping rate		

AIB-1.4 PAST, PRESENT, AND FORESEEABLE FUTURE WELL WATER CONSUMPTION ESTIMATES

Based upon GIS data obtained from Utah Division of Oil, Gas and Mining (UDOGM) database, and as shown in Table AIB-1-2 it is estimated there are 434 wells, as of October 23, 2024, in the stages of producing/been drilled or approved/currently being drilled status. With the highest quality data available it is estimated that vertical and directional wells on average use 5 acre-foot and horizontal wells average 56 acre-foot of water to drill and complete a well. There are approximately 412 wells that have been drilled in the HUC 10 Boundary (Asphalt Wash-White River (1405000707)). 176 wells are vertical drilled wells, 234 wells are directional drilled wells and 3 horizontal drilled wells. This totals approximately one time use of 2,218 acre-feet of water used. There are approximately three (3) well in process of being or has been drilled at this time. These wells are horizontal wells and would total approximately 168 acre-feet of water used for the drilling and completion of the well. There are approximately 19 well that's received an approved permit to drill (APD) in this HUC 10 Boundary. This well is estimated to use 1,064 acre-feet of water for the drilling and completion of this well. The applicants have three (3) years from approval date of an APD to drill and complete the well. Water could be drawn at any time during that three (3) year timeframe.

Table AIB-1-2: Cumulative APD Water-Consumption Estimates

Well Status	Counts	Vertical ¹	Directional	Horizontal ²
Current/Past wells				
Producing Oil or Gas Well (P)	334	129	203	2
Shut-in Oil or Gas Well (S)	71	40	31	1
Drilling Operations Suspended (OPS)	0	0	0	0
Temporarily Abandoned Oil or Gas Well (TA)	7	7	0	0
Totals:	412	176	234	3
Current Wells				
Well Spudded and/or Currently Drilling (DRL)	3	0	0	3
Totals:	3	0	0	3
Future Wells				
Approved Permit to Drill (APD)	19	0	0	19
Totals:	19	0	0	19
Grand Total of Wells	434	176	234	25
Percent (%)	-	41%	54%	6%
Estimated water used (acre-foot)*	-	880	1170	1400
¹ Vertical/Direction averages to 5 acre-foot of water per well.				
² Horizontal averages to 56 acre-foot of water per well.				

Past, present, and reasonably foreseeable actions, plans, projects, or activities impacting water quality and quantity (surface and ground water) within the analysis area include mineral development (e.g., oil and gas development), state-owned land development, and municipality development, OHV-related activities, range-related activities (e.g., grazing and water source developments), White River restoration projects, as well as any other reasonably foreseeable projects, ongoing seasonal snowmelt runoff, and monsoon events on disturbed areas in the analysis area.

AIB-1.5 CONCLUSION

Water obtained from the White River and/or the local alluvial aquifers (Kimball and Holmes 1987) could result in the drawing down of the water table and reduction of available water resources for wildlife, vegetation, springs, streams, or public consumption. Withdrawal could affect local groundwater flow patterns and create changes in quality and quantity of the remaining groundwater based on the quantity of water required for surface management and downhole operations. The quantity and quality of water used, produced, and disposed of or re-used varies enormously depending on local geology, financial constraints, and regulations, with implications for the environmental impacts of oil and gas production (American Geosciences Institute, 2018). The direct and indirect effects to water resources from construction and operation of the proposed project may include surface water depletion for use during

construction, degradation of surface water from potential spills during construction and operations, and degradation of surface water due to sedimentation and turbidity from construction activities and vehicle use during operations.

Because of the estimated water withdraw flowrate (5.6 acre-ft/day) for the proposed project, compared to the anticipated low flow rate of the river (400 acre-feet per day), short-term impacts to the river and its dependent resources (e.g., wildlife, vegetation, or public consumption) are not anticipated. Long-term surface water depletion is managed by the State through the water right terms and conditions and reporting.

The proposed casing and cementing design would isolate the well bore and associated frac and production fluids from contact with subsurface resources, such as useable water, including groundwater, and other important mineral bearing zones as identified in the geologist's report generated as a part of the APD review. By applying reclamation features, water used, and design features outlined in Section 2.2.3, 2.2.4, and 2.2.6, relating to erosion control, drilling fluids, and reclamation, impacts to water quality, quantity, and other water resources lower in the watershed would be reduced.

AIB-1.6 REFERENCES

- American Geosciences Institute. (2018, 06 01). Water in the Oil and Gas Industry. Retrieved from American Geosciences Institute: <https://www.americangeosciences.org/geosciencecurrents/water-oil-and-gas-industry>
- Deiter 2017. Dieter, C.A., Maupin, M.A., Caldwell, R.R., Harris, M.A., Ivahnenko, T.I., Lovelace, J.K., Barber, N.L., and Linsey, K.S., 2018, Estimated use of water in the United States in 2015: U.S. Geological Survey Circular 1441, 65 p., <https://doi.org/10.3133/cir1441>. [Supersedes USGS Open-File Report 2017–1131.] Note: this report points to the following website for county specific data. <https://nwis.waterdata.usgs.gov/ut/nwis/wu>
- Kimball, Briant A., and Walter F. Holmes. 1987. Ground Water in the Southeastern Uinta Basin, Utah and Colorado. U.S. Geological Survey Water-Supply Paper 2248. 55 p
- USGS 2024, Accessed October 2024; <https://waterdata.usgs.gov/monitoring-location/09306500/#parameterCode=00060&period=P30D&showMedian=false>

AIB-2 RECREATION

AIB-2.1 ANALYSIS AREA

The impact analysis area for recreation is a 5-mile radius from the project location. Recreational opportunities and activities within or near the project area consist mainly of off-highway vehicle (OHV) driving, hunting, and river recreation. There are no designated Special Recreation Management Areas or developed recreation sites located within the area. Recreational visitor use within the project area is dispersed, seasonal, and low intensity. The project area is in an

Extensive Recreation Management Area (ERMA), which is managed to provide a more primitive recreation experience with minimal facilities and development.

AIB-1.2 PROJECT RECREATION INFORMATION

The closest BLM developed recreation site to the project area is the Enron White River Boat take-out, 11.5 aerial miles away, which attracted approximately 1,965 visitors in 2024 per data collected throughout the year from vehicle count data. The closest developed public recreation facility is the White River Boat Ramp at Bonanza Hwy, six aerial miles distant. Per the Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development – The Gold Book (BLM, 2007), temporary or longer-term impacts from the Proposed Action, such as road upgrades, increased vehicle traffic, construction, noise, dust, and/or surface disturbances, would be localized and minimally disruptive to recreational access and dispersed recreation opportunities within the parcels as alternative travel routes and public lands would still be available in the vicinity.

The White River is 1.3 miles away from the proposed project. Historically and currently, the primary seasons of use for the White River is during higher flow time frames late-April through early-July. Most of the recreational use on this section of the White River are those individuals participating in floating the river. While the White River can be accessed by vehicle from Asphalt Wash Road, the primary point of access for those participating in water-based recreation is the White River Boat Ramp at Bonanza Hwy.

The Proposed Action would completely be blocked from the view of those participating in water recreation on the White River due to distance, the surrounding terrain, and pinyon-juniper vegetation.

Flowing water in rivers creates its own ambient noise levels which can be measured in decibels; these levels are often higher when water flows are higher (heavy rain events or spring runoff from snow melt). Sound levels of the White River at the riverbank during low levels as taken on November 22, 2024 were reading an average sound of 56 decibels with a high of 60 decibels. It can be assumed that during high flows the sound would be increased as more water is present in the river channel. The ever-present ambient noise of the river would dominate any residual noise from the Proposed Action if it were to carry that far. However, it is extremely unlikely that sounds from the Proposed Action would carry that distance with the existing topography and vegetation. Therefore, recreation will not be carried forward for detailed analysis.